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# Factor that influence the critical thinking skills of public school teachers in a parish in Southwest Louisiana

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FACTORS THAT INFLUENCE THE CRITICAL THINKING  
SKILLS OF PUBLIC SCHOOL TEACHERS  
IN A PARISH IN SOUTHWEST  
LOUISIANA

A Dissertation

Submitted to the Graduate Faculty  
of the Louisiana State University and  
Agricultural and Mechanical College  
in partial fulfillment of the  
Requirements for the degree of  
Doctor of Philosophy

in

The School of Human Resource Education  
and Workforce Development

by  
Dale B. Schanz  
B. A., McNeese State University, 1970  
M. Ed., McNeese State University, 1983  
May, 2010

In loving honor and memory of the men in my life:

My Lord and Savior Jesus Christ,

My husband David J. “Jack” Schanz, Jr.,

My father Louis P. “Neg” Beglis.

In loving honor and memory of the women in my life:

My grandmother Josephine Isaac,

My mother Drusilla Isaac Beglis,

My daughters Dielle and Dara,

My granddaughters Jacquelyn Joy, Alexandra Loré, and Emma.

## **ACKNOWLEDGEMENTS**

### My Family

My husband of forty years has been a constant source of encouragement and stability, even when he was under extreme physical duress. Having been a former heart surgery patient, he has remained positive in the face of excruciating odds. When he was downsized from his former position at a petrochemical industry in the parish in 2004, he kept the faith and has been the one true human light in my existence. He probably deserves a “hard luck Ph.D.”

My two very beautiful and moral daughters, as well as my three granddaughters, will always be my legacy. They are my greatest accomplishments. I have been truly blessed with such physically gorgeous young women who are not only strikingly attractive on the outside, but pretty on the inside as well. My husband is definitely a blessed man to have so many females to look upon. Dielle, our eldest daughter, has an Masters of Education in Supervision and Administration and is the assistant principal at Sulphur High School, the largest populated secondary public institution in Calcasieu Parish. Dara Jo, our youngest daughter, teaches fellow science teachers in our parish how to facilitate their classes. Jacquelyn Joy, our oldest granddaughter, is a SPARK (gifted) student at W.W. Lewis Middle School in Sulphur. Alexandra Lore, our five-year-old granddaughter, is in kindergarten at Frasc Elementary School in Sulphur. Emma, our youngest granddaughter is a toddler at Henning Methodist Day Care. My sons-in-law have contributed to and enhanced our family environment. Robert “Binky” Barrentine is assistant principal at W.W. Lewis Middle School in Sulphur, Louisiana, the largest middle school in the city. Timothy Happy Johnson is an agriculture major from McNeese who has now graduated as a licensed electrician from ABC, a proprietary training school in our vicinity.

Drusilla “Dru I” Isaac Beglis, my mother, has been a true warrior in my uphill quest to get this doctorate. She always wanted me to be a “doctor,” and instilled that seed in my being at a very young age. She was joined in those expectations with my formidable patriarch, Louis Peter “Neg” Beglis, for whom Beglis Parkway (Highways 27 and 108 in Calcasieu Parish) was named. Daddy went on to be with the Lord in his sixth term as police juror of District 13, Ward Four, in the parish. He died in 1992, before he knew that “his professional student” was working on a Ph.D. Somehow, I know that he is aware of this longtime dream being fulfilled.

My matriarchal grandmother, Josephine Isaac, was only schooled in primary grades and completed the fourth grade. “Mama Jo,” her name to all of the community, was married at the age of thirteen. She had seven children: Aunt Jackie, who became a housewife after she married; Uncle Ike, who graduated with a degree in physics; Uncle George, who became an optometrist, after completing studies; Dorothy Mae “Aunt Fritz” who was the valedictorian of her graduating class; Drusilla, who was a homemaker and the mother of six children; Joyce, who quit her post studies one year before graduating as a pharmacist to be a mother of four boys; and, John Calvin “Jay,” who completed two years in college and joined the armed forces to serve in Germany. Mama Jo’s grandchildren include attorneys, doctors, and teachers.

My four sisters, Louise Nichols, Diana Backhaus, Drug II Ellender, and Sallye Rhodes, have always encouraged me!

### My LSU Family

LSU has always held a nostalgic place in my heart. When I stepped on the campus to inquire about the doctorate program, I had a magical feeling. I was unable to attend LSU when pursuing my undergraduate degree due to financial constraints at that particular time, so achieving a doctorate from such a distinguished university will forever enamor the purple and gold to me.

Upon finally making the decision to consider enrollment at LSU, I made an appointment with Dr. Earl Cheek of the Curriculum and Instruction Department. Dr. Cheek gave me some astute advice when he directed me to the School of Human Resource Education and Workforce Development. He described Dr. Mike Burnett, School Director, as being a man of integrity, and informed me about the program offerings under Dr. Burnett's tutelage.

I certainly echo those sentiments and must add that I have never seen such a diligent and fair person as Dr. Burnett. He is truly an asset to LSU. In a day when the middle class work ethic seems to have been forgotten, it is apparent that Mike Burnett has kept the pace and will always keep his schedule busy with the service qualities he displays at all times to all who cross his path – both students and co-workers. I will be eternally grateful to Dr. Burnett for becoming my major professor when Dr. Verma retired.

Dr. Satish Verma showed real patience with me throughout the process. Even though I did not meet the traditional doctoral qualities of university students, Dr. Verma's faith in me never wavered. He was kind to me in his classes and in his overall demeanor as my beginning major professor. One could not ask for a gentler person to work with.

The instructor of my first LSU class was Dr. Joe Kotrlik. When I examined the agenda and syllabus, I was overwhelmed by the requirements. As the classes developed, I found Dr. Kotrlik to have high expectations, but he provided assistance. Dr. Kotrlik is a true professional with a strong inner ability to bring out the very best in his students, a quality I greatly admire.

Dr. Donna Redmann is a bubbly outgoing female balance to the dissertation committee. She gives a fresh, invigorating perspective to writing and ideas. Her intuitive nature has given me support at crucial times. She often helped me with suggestions when the process became too wieldy.

Dr. Alex Cohen is the Dean's Representative on my committee. It pleased me that his home department is psychology for I believe that psychologists can see the soul, the real human spirit in those persons with whom they interact. I welcome him as a part of my LSU family.

Dale Beglis Schanz

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## **ABSTRACT**

The purpose of this study is to determine the influence of selected personal and professional demographic characteristics on the critical thinking abilities of teachers in a parish in Southwest Louisiana. The study is a correlational design using a descriptive survey technique with questions for the data collection. The examiner looked at attribute independent variables – characteristics that a subject has before a study begins such as gender, age, race, highest level of education completed, and years of teaching experience. Three hundred and twenty-four teachers in twelve public schools (three high schools, four middle schools, and five elementary schools) participated in the research. The examiner hypothesized that critical thinking is a by-product of higher-level post-graduate degrees. However, this theory was not proven in the study. There were few findings that showed relationships to the independent variables. One finding was that Caucasians had higher critical thinking scores than other races. Another finding was that social studies teachers ( $M = 4.72$ ,  $SD = 1.13$ ,  $t = -2.45$ ) at the middle school level had higher scores on the Watson Glazer Critical Thinking Appraisal Short Form Test sub-scale of “Interpretation” than did middle school teachers in other content areas. The researcher found that 51 males (15.8%) and 272 (84.2%) females participated in the study, showing a huge gender disparity among teachers who participated in the study. The researcher concluded that high school mathematics teachers had higher critical thinking skills in four sub-scales than other high school teachers in other areas. A finding showing that high school mathematics teachers had higher scores on the WGCTA sub-scales of Deduction ( $t_{103} = -2.84$ ,  $p = .03$ ), Interpretation ( $t_{103} = -2.22$ ,  $p = .03$ ), and Overall Scales ( $t_{103} = -2.20$ ,  $p = .03$ ) than high school teachers who did not identify mathematics as a primary content area of teaching. The researcher recommends that additional research should be done to confirm or disprove the finding that math content influences critical thinking.

## **CHAPTER ONE: INTRODUCTION**

Teaching is a profession that touches the lives of all Americans. No matter what future a student is planning, the teaching of that male or female is important not only to him or her, but to the United States of America. Americans have become used to freedom- a freedom that came about because of the critical thinking skills of a group of early dissenters. Those nonconformists weighed the risks with higher-order thinking and then boldly sacrificed personal security for opportunities to develop a new life in a foreign land. Immigrants still view America as a land of opportunity! They see America as a place where effort can produce advancement in status, education, and in finances.

Throughout history, we see the rise and fall of cultures that did not utilize or listen to the critical thinking populace. Instead, we know that the citizenry of those worlds led them down paths of destruction because of a lack of progressive, problem-solving people. Ancient empires have dissolved when the leadership of those cultures have lacked in critical thinking skills. Nations have died when men lacked the wisdom found only when one has critical skills and the fortitude to carry out edicts with reasoning and higher order thinking.

### **Rationale**

A critical thinking teacher who uses higher order thinking skills in the classroom is a necessary part of the United States way of life. Such teachers are essential for future progress and maintenance of a democratic republic. Without critical thinking skills in education, the USA will diminish in world dominance as a superpower. Not only is superpower status in question, but the lifestyles of Americans are also in jeopardy if critical thinking diminishes. Speculation about the future workforce lends one the idea that the USA could have possible droughts in workforce problem solvers.

Americans have confronted and faced issues in the present and past workforce that

demanding that workers have critical thinking skills. Critical thinking skills are necessary to protect families, to preserve human rights, and to encourage lives of autonomy, security, and integrity. Society in the United States is no longer a simple grouping of norms and mores. Families are diverse. The traditional family of husband as head of the household, mother as the house worker and cook, and two children is a memory. Many households include single parent breadwinners and latch key children.

Other differences exist that were not addressed in the past. These civic and national issues include solid waste management, depletion of the ozone layer, terrorist attacks, pollution, and a fluctuating economy (Paul 2). Never has such a need been found for critical thinking problem solvers. "The changing demographics of the workforce have a major impact on various markets. This new multiplicity includes changes in age, gender, racial and ethnic backgrounds, and national origins to the workforce that graduates of business schools will manage. The numbers of almost all minority groups are increasing" (Jones 3-4). Jones adds that college graduates will be expected to make informed and practical decisions often in very controversial conditions (Jones 4-5). Critical thinking skills are being stressed as essential for such workforce diversity.

Global communication by computer technology has opened up an information network and has speeded up work efficiency. At the same time, with this ease of communication comes a decrease in privacy. Bills are being passed to monitor computer use in homes, industries, schools, and public institutions.

With the changes going beyond multiple-choice testing, differences in assessment have evolved as well. Altered assessment practices are affecting curriculum, teaching strategies, and students' understanding of the meaning of their work. Development of methods for assessing critical thinking and involving complicated, complex knowledge and performance are necessary

in order to drive assessment to judge student achievement based on performances of complex tasks and work selections.

Since all students, grades k-12 and in higher education have a broad range of abilities, teachers need to assess in such a way as to enable students to use and demonstrate these talents and abilities. Teachers, therefore, must use critical thinking skills when planning lessons and assessing learning. Teacher demand is high; but even more in demand are teachers who employ and practice critical thinking skills strategies in their classrooms. According to Holmgren and Covin, one of the major responsibilities of teacher preparation institutions is to screen and select the best possible candidates for the teaching profession (321).

Teachers are expected to function in highly accountable public schools with growing ranges of student intelligence levels. Students must function in more technologically advanced settings. While performing independently, the teachers are expected to encourage and exhort learners to be critical thinkers. Because of school accountability issues, classroom pupils cannot be taught by memorization and rote as in former days. Quality reasoning is now demanded in order to have learners simulate circumstances. Such methods of classroom facilitation better equip the learner for the world workforce.

The issue of critical thinking has risen as teacher evaluation measures have stressed high-order thinking. In the state of Louisiana, one of the components of the first-year teacher evaluation instrument is focused on higher-order thinking. If the teacher does not demonstrate the power to draw out or lead a discussion promoting such higher level thinking and dialogue, then that teacher will fail the instrument and will have to lengthen his or her time while undergoing the initial evaluation period (Louisiana Components of Effective Teaching 1). With such added concentration and focus on critical thinking comes awareness by the rookie teacher of the relevance of higher-order thinking. The stress on critical thinking is cited in various



sources including the Louisiana Teacher Assessment Program, magazines, periodicals, convention speakers, and Internet sources (Louisiana Department of Education Handbook, 2006). Linda Darling-Hammond from Stanford University and Barnett Berry from the University of Chapel Hill in North Carolina said in 2006,

the nation must replace much of its current teaching force. This heavy recruitment period will have major implications for both educational quality and equality. Qualified teachers are not only a major determinant of student achievement but also one of the most inequitably distributed educational resources. Poor and minority children are routinely exposed to poorer quality curricula and teaching, which account for much of the achievement gap (1).

A deluge of articles and publication has been written detailing the significance of critical thinking including a Foundation for Critical Thinking and a website ([www.criticalthinking.org](http://www.criticalthinking.org)) established by those who consider critical thinking of crucial magnitude. Several definitions are given by numerous sources. The APA Delphi Report states, “Critical thinking is the process of purposeful, self-regulatory judgment” (Merriam and Cunningham 1989). For adults to improve their critical thinking skills, they must be given continual opportunities to think critically. Learners in the classrooms must not only be given the opportunity to think, but they must be given the opportunity to discuss their thoughts, processed with other students and with teachers.

“Critical thinking is developed through the process of discovering the answer, but not from the answer itself” (Merriam and Cunningham 1989). For adults to improve their critical-thinking skills, they must be given continual opportunities to think critically. “The teaching of critical thinking begins with educators who are themselves critical thinkers” (Merriam and Cunningham 1989). Concerns about the poor quality of reasoning that teachers exhibit in problem solving are often mentioned by principals, counselors, and other administrative staff members (Wenglinsky 35) who meet to discuss the practice of teaching students to attain higher levels of thinking.

Universities often offer courses in critical thinking in order to aid students. Goals for

such courses may state that students are expected to develop to their utmost potential. Such courses are commonly called basic studies or orientation. The courses enhancing critical thinking often allow opportunities for discussion, constructed-response writing, open-ended questioning and answering (Deggs 2003). On the other hand, opposite to the notion of encouraging critical thinking, there are situations that create a definite decrease in critical thinking. Dilenschneider (2000) reported that he was distressed because advanced writing courses in high school were being replaced with curriculum on using new communications hardware and software (25). The weight of current research suggests that the goal of teaching students to think remains elusive. Dilenschneider (2000) says “we are using our electronic capabilities for games and gossip” and he “deplores the fact that advanced writing courses are now being replaced in the curriculum by computer courses” (25).

The National Assessment of Educational Progress (Wenglinsky 35) assesses both student learning and teacher practices in the classroom every year or two. The results prove that teaching, using critical thinking activities, benefits students in the assessment area. A clear pattern shows that teaching for meaning is associated with higher NAEP test scores (Wenglinsky 35).

Principals, counselors, and other administrative staff members often mention concerns about the poor quality of reasoning teachers are exhibiting in problem solving teaching skills (Wenglinsky 35). Often, staff meetings open up discussions about the lack of overall student use of higher-order thinking skills. Many states have included constructed-response questioning on criterion-based tests in an attempt to emphasize critical thinking skills. The *No Child Left Behind Act* includes specific recommendations about thinking critically and communicating effectively has come to rest on state governments as far as interpretations are concerned (Louisiana Department of Education 2006). In Louisiana, the Board of Elementary and Secondary

Education has the task of orchestrating federal guidelines (BESE 2007). Critical thinking, problem solving, or thinking with reason - skills are created and correlated to content matter when attempts of making goals or objectives within the educational realm.

The Swiss psychologist Jean Piaget studied the development of thinking (Merriam and Cunningham 35). He identified individuals at the highest level of thinking as being formal-operational. He described such individuals as being able to generalize and transfer these concepts to new situations (Merriam and Cunningham 35). Glaser in 1941 further defined critical thinking as being “a matter of being disposed to use the attitudes and knowledge” (Fisher 4). President Clinton and Congress adopted six educational goals called Goals 2000 (Louisiana Department of Education Bulletin 2006). Goal 5 clearly focuses on critical thinking (Louisiana Department of Education Bulletin 2006). When President Bush took office, his educational objectives evolved from those of President Clinton’s Goals 2000 and were called *No Child Left Behind* (Louisiana Department of Education Bulletin 2006). The importance placed on critical thinking has remained at the forefront of American education.

### **Statement of the Problem**

What, then, happens if the public school classroom teacher does not have the critical thinking skills at the top of Bloom’s Taxonomy Chart? Due to a lack of research describing the critical thinking skills of currently employed certified public school teachers, there is a need for studies investigating the critical thinking abilities of this particular populace. Pithers and Soden suggest that “not all students may be good at critical thinking nor do some teachers appear to teach students good thinking skills” (237). Linda Darling-Hammond, from Stanford University, stated that, “The kind of pedagogy needed to help students to think critically and solve complex problems as well as to master ambitious subject-matter content is much more demanding than that needed to impart routine, low-level skills (1). She further added that, “very knowledgeable

and skillful teachers who are able to respond appropriately to students' needs can enable diverse learners to succeed at these much more challenging learning goals" (1).

### **Purpose of the Study**

The purpose of this study is to determine the relationships or influences of selected personal and professional demographic characteristics on the critical thinking abilities of currently employed teachers in a parish in Southwest Louisiana.

### **Objectives**

The specific research objectives for this study are:

1. To describe currently employed public school teachers in a parish in Southwest Louisiana on the following selected personal and professional demographic characteristics:
  - a. Gender,
  - b. Race,
  - c. Age,
  - d. Highest level of education completed,
  - e. Grade level(s) taught,
  - f. Subject(s) taught, and
  - g. Years of teaching experience.
2. To describe public school teachers in a parish in Southwest Louisiana on their critical thinking abilities as measured by the Watson-Glaser Critical Thinking Appraisal Short Form.
3. To determine if a relationship exists between the critical thinking abilities (as measured by the Watson-Glaser Critical Thinking Appraisal Short Form) of public school teachers in a parish in Southwest Louisiana and the following personal and professional demographic characteristics:

- a. Gender,
  - b. Race,
  - c. Age,
  - d. Highest level of education completed,
  - e. Subject(s) taught, and
  - f. Years of teaching experience.
4. To compare the critical thinking abilities (as measured by the Watson-Glaser Critical Thinking Appraisal Short Form) of public school teachers in a parish in Southwest Louisiana by the level of their current primary teaching assignment (defined as elementary, middle, or secondary).
5. To determine if a model exists explaining a significant portion of the variance in critical thinking abilities (as measured by the Watson-Glaser Critical Thinking Appraisal Short Form) of public school teachers in a parish in Southwest Louisiana from the following personal and professional demographic characteristics:
- a. Gender,
  - b. Race,
  - c. Age,
  - d. Highest level of education completed,
  - e. Grade level(s) taught (defined as elementary, middle, or high school,
  - f. Subject(s) taught, and
  - g. Years of teaching experience.

### **Significance of the Study**

This study has potential conclusions that warrant further research. Because the research concerns the critical thinking skills among currently employed public school teachers in a

parish in Southwest Louisiana, speculation of multiple potential benefits could possibly occur. First, the study will compare a population of teachers in a parish in Southwest Louisiana who have varying levels of critical thinking abilities. If the results show that currently employed public school teachers in Southwest Louisiana have high or low critical thinking abilities, then future studies could be recommended to determine why certain teachers have higher or lower critical thinking skills than other public school teachers in the same parish. Professional development in-service programs can be held to increase the critical thinking skills of the teachers who scored at lower levels on the *Watson-Glaser Critical Thinking Appraisal Short Form*. If the study proves that teachers with higher levels of education showed higher critical thinking skills, then those currently employed public school teachers who have bachelor degrees can be encouraged to further educational opportunities through such methods as grants, scholarships, and tuition exemptions. Greater priority can be placed on encouraging currently employed teachers to pursue advanced degrees on a part time basis. In addition, if this is confirmed, a greater emphasis can be placed on hiring teachers who have higher levels of education. If the research results identify factors related to critical thinking abilities, then supervisors and others, such as academic coaches for faculty, could use such information to identify teachers who are in greatest need of assistance and help them in teacher professional development.

### **Definition of Terms**

The following selected terms were found in the Louisiana Department of Education Bulletin 1103 (2006) and are being used for the purpose of this research:

Core academic subject – English, reading or language arts, mathematics, science, foreign languages, civics and government, economics, arts, history, and geography. The Louisiana Bulletin 1103 defined “arts as a core academic subject” to include those

secondary courses in visual and performing arts for which Carnegie units (credits) are issued in high school. For this study, all of the high school credited courses will also be considered as core subjects in middle school.

Elementary education teacher – teacher in a school, who holds a standard teaching certificate appropriate for grades 1-8. For the purposes of this study, the researcher defined an elementary education teacher as a teacher who facilitates classes in K-5.

High school teacher – teacher, grades 9-12, who holds a standard certificate for every core academic subject the individual teaches. For the purposes of this study, the researcher defined a high school teacher as a teacher who teaches in grades 9-12.

Middle school teacher- teacher who holds a standard certificate for middle school education.

These include the core subjects of English/language arts, mathematics, science, or social studies; secondary academic content areas, and special foreign language certificates to teach specific foreign language in grades k-8. For the purposes of this study, the researcher defined a middle school teacher as a teacher who teaches in grades 6-8.

Standard teaching certificates- candidates who have completed a state-approved teacher education programs in either a traditional or alternate approach and who have earned degrees from a regionally accredited institution of higher education or approved private or parochial providers.

Statutory requirements for certification- a teacher must hold at least a baccalaureate degree and have earned a minimum cumulative grade point average cumulative of 2.50; in addition, the person must have demonstrated a proficiency of content knowledge and teaching skills in the area of certification by passing the required state selected exam, which are in this state.

## **CHAPTER TWO: REVIEW OF RELATED LITERATURE**

### **Preview**

In presenting a review of literature for a focus on critical thinking skills and abilities, a researcher has to focus on brevity due to the enormity of the task. “Critical thinking” has become quite popular as a topic for consideration. To show the interest and broadness that pertains to “critical thinking,” one “hit” in a search engine resulted in some 7,000 web site addresses. The question naturally becomes, “What is the best site for relevant information?” The subject of critical thinking skills is of global interest and, certainly, the United States of America is, or should be, the leader in the research for understanding, encouraging, and using critical thinking skills.

A review of relevant literature beginning with a brief history of critical thinking will be presented in this section. Explanations of descriptions pertaining to the history of critical thinking philosophies are included in the Review of Literature in order to clarify the evolutionary aspects of critical thinking and critical thinking metacognition. Examples of the philosophical styles of learning are presented in order to give insight into the evolution of critical thinking theories. Finally, a summary will serve as a basis for the next chapter on methodology.

Many references will be given to the works of dominant authors in the field of critical thinking. Extensive works by Facione, Paul, Dewey, Marshall, Tucker, and Leming are among those who are known for studies in critical thinking. Methodologies and literature for the teaching of critical thinking skills are included as part of this literature since the classroom teacher can use this information for building lesson strategies that incorporate critical thinking skills as a part of the learning environment.



## Historical Perspective of Critical Thinking

Socrates was probably the earliest proponent of thinking skills usage. He saw himself as a person “who prodded people into thinking” (Ozmon and Craver 14). Gary, in his work arguing for leisure as a valuable way of learning, describes Socrates’ philosophical tradition as, “embodied in the modern research university’s quest for new knowledge” (3). Fortunately, Socrates’ pupil Plato later illustrated Socrates’ question and answer, or dialectical approach. Socrates did lead his following to examine themselves and their cultural habits. These occurrences happened in the years of 469-399 B.C., almost 2500 years ago (Ozmon and Craver 15).

Plato started as an intern of Socrates and always remained loyal to Socratic beliefs. Plato’s works, *The Republic and Law*, dealt with varied topics. In Plato’s writings, he engages in the dialectical approach to problems. Plato’s school, The Academy, was opened after Socrates’ death (Ozmon and Craver 15-18). In the school, students and teachers used the dialectical approach to problems, wherein both sides of issues were questioned and addressed. Professors in the Academy engaged in logical argumentation with students. Pupils were taught to examine both sides of the issue when using the dialectic approach. The dialectical approach to thinking was viewed and used for centuries in higher learning circles (Ozmon and Craver 15-18).

Different philosophical teachings in history emphasized consciously directed activities, but teaching styles were dialectical in nature until the 17<sup>th</sup> and 18<sup>th</sup> centuries when memorization, repetition, and rote learning were emphasized. During the “middle” centuries, only the well-to-do or elite was educated. In most nations, classes were common and the upper class received instruction (Ozmon and Craver 33, 39).

In America, in the early 1800’s, religious classes were held so that students could read the Bible (Ozmon and Craver 38). Land grant colleges like LSU started opening in the 1860’s

(Higgins 2003). These land grant colleges prepared students for the agricultural areas and some professions, such as business merchants. Reading, writing, and arithmetic were stressed in the curriculum and students were not encouraged to think with higher-order thinking skills. Most learning basically was rote memorization. Critical thinking skills were not noted in this historic period. The nineteenth century brought about some change by educators Horace Mann and John Stuart Mill who encouraged and stressed intellectual activity. These educators urged critical thinking skills by reminiscing about children not understanding when they memorized (Ozmon and Craver 169).

### **Current Definitions of Critical Thinking**

John Dewey, the pragmatist, encouraged a diversified curriculum with social and communal contact. He believed in informal processes of learning associated with the experiential background of students. Dewey endorsed the idea of a teacher helping the child to think and act intelligently. He encouraged teachers to help learners “identify problems, frame questions, and locate appropriate bodies of knowledge to better understand present issues and their business” (Ozmon and Craver 153).

John Dewey felt that experiences could not be disassociated from learning. He championed his idea of contemplation as being part of a student’s experiential background. Although he was labeled as a “progressive” for his time, his beliefs are not necessarily true of the progressive movement. He is known more for having listed critical thinking skills in the realm of social communications and using real-life situations to formulate problem-solving techniques. Dewey, known as the “father of the modern critical thinking tradition,” called the thinking “reflective.” He defined reflective thinking as “active, persistent, and careful consideration of a belief or supposed form of knowledge in the light of the grounds which support it and the further conclusions to which it tends” (Fisher 8). Dewey further labels critical thinking as active

thinking differentiating it from impulsive or unreflective thinking (Fisher 2). Such a contrast denotes times when a human has to make a quick, responsive decision without time for contemplation. His ideas bring in the concept of reasoning about decisions (Ozmon and Craver 161-165). Critical thinking calls for a persistent effort to examine any belief or supposed form of knowledge in the light of the evidence that supports it and the further conclusions to which it tends (Fisher 2-3).

Edward Glaser, another well-known expert in the field of critical thinking and author of the most widely used test of critical thinking, defined critical thinking in 1941 as:

- (1) an attitude of being disposed to consider in a thoughtful way the problems and subjects that come within the range of one's experience;
- (2) knowledge of the methods of logical inquiry and reasoning; and
- (3) some skill in applying those methods (5).

Glaser's definition has similarities to that of Dewey's. The difference seems to be in the word "disposed." Without "prompting," a person could have the passive ability without ever being disposed to do the task (Fisher 3-4). Hoefler of Dickinson College says that critical thinking "requires students to question something they may have a great deal of confidence in their innate ability to interpret accurately the things they see, feel, hear, and read" (Hoefler 538). Several other persons are known in the area of critical thinking as well, but not to the extent of Dewey and Glaser. Robert Ennis is a third authority in the field of critical thinking. In 1989, he defined critical thinking as "a reasonable, reflective thinking focused on deciding what to believe or do". Ennis contends that decision-making is another part of the critical thinking process (Fisher 4).

Richard Paul gives a little different outlook on the definition. He says: "critical thinking

is that mode of thinking – about any subject, content, or problem – in which the thinker improves the quality of his or her thinking by skillfully taking charge of the structures inherent in thinking and imposing intellectual standards upon them” (Paul et.al. 4). “Thinking about one’s thinking,” or *metacognition* is a feature of critical thinking that most educators and researchers agree is the only realistic way to develop human critical thinking. Researchers who are working in the critical thinking skills areas often add skills that underlie critical thinking. These skills are:

(a) to recognize problems, (b) to find workable means for meeting those problems, (c) to gather and marshal pertinent information, (d) to recognize unstated assumptions and values, (e) to comprehend and use language with accuracy, clarity and discrimination, (f) to interpret data, (g) to appraise evidence and evaluate statements, (h) to recognize the existence of logical relationships between propositions, (i) to draw warranted conclusions and generalizations, (j) to put to test the generalizations and conclusions at which one arrives, (k) to reconstruct one’s patterns of beliefs on the basis of wider experience; and (l) to render accurate judgments about specific things and qualities in everyday life (Fisher 7).

Facione lists the cognitive skills as being interpretation, analysis, evaluation, inference, explanation, and self-regulation. These coincide with the higher level thinking skills from Bloom’s Taxonomy (Bloom 1956). The upper level of the taxonomy includes the competencies of synthesis and evaluation. The skills demonstrated in synthesis include using old ideas to create new ones; generalizing from given facts; relating knowledge by a cross-disciplinary approach or from several areas; predicting or drawing conclusions. In the evaluation competency, skills shown are comparing and discriminating between ideas, assessing value of theories, presentations, making choices based on reasoned argument, verifying value of evidence, recognizing subjectivity.

Researchers have found that critical thinkers-doers must have critical spirits as well. The connotation of “critical spirit” usually is taken to be negative; however, in this study, to have a critical spirit is definitely positive. In the research using Delphi Method, critical thinking approaches were described after having a central investigator organize, question, receive

responses, and transmit to a group of 46 men and women from the United States and Canada.

The respondents were considered to be experts in the field of critical thinking (Facione 12).

Findings from the Facione study lead to the following approaches to life and living

characterizing critical thinking in this study included:

- (1) inquisitiveness with regard to a wide range of issues,
- (2) concern to become and remain well informed,
- (3) alertness to opportunities to use critical thinking,
- (4) trust in the processes of reasoned inquiry,
- (5) self-confidence in one's own abilities to reason,
- (6) open-mindedness regarding divergent world views,
- (7) flexibility in considering alternatives and opinions,
- (8) understanding of the opinions of other people,
- (9) honesty in facing one's own biases, prejudices, stereotypes, or egocentric tendencies,
- (10) prudence in suspending, making or altering judgments,
- (11) willingness to reconsider and revise views where honest reflection suggests that change is warranted (Facione 8).

The panel experts who participated in the critical thinking panel for the Delphi Method survey

went ahead and described the approaches to life and living in general to emphasize approaches

that good critical thinkers have toward life. They are:

clarity in stating the question or concern; orderliness in working with complexity; diligence in seeking relevant information; reasonableness in selecting and applying criteria; care in focusing attention on the concern at hand; persistence through difficulties are encountered; precision to the degree permitted by the subject and the circumstances (Facione 9).

Findings from the Delphi Method study also included conclusions that the person(s) who lacked the dispositions and approaches would probably have a reasonably low self-esteem, not be a fact-finder, be close minded, deny his or her own biases and faults, jump to conclusions, delay in making judgments, and never reconsider opinions. In addition to the initial conclusions, the panel experts in the study summarized that a poor critical thinker would approach specific problems or issues with simple, vague or overly generalized responses. Finally, Facione and others in the critical thinking panel for the Delphi Method study showed that other symptoms of poor critical thinking might be applying unreasonable criteria or disorganized thoughts when attempting to use reasoning skills (Facione 9).

Facione lists statements of people who are strongly disposed toward critical thinking. Some of them include, “Rather than relying on someone else’s notes, I prefer to read the material myself” or “I try to see the merit in another person’s opinion even if I reject it later” (Facione 9). For those who show weak critical thinking dispositions, statements like, “I prefer jobs where the supervisor says exactly what to do and exactly how to do it” or “If my belief is truly sincere, evidence to the contrary is irrelevant”(Facione 9). The term “good” critical thinker might better be stated as simply “critical thinker.” The “bad” or “poor” critical thinker is just “not a critical thinker.” The panel experts in the critical thinking for the Delphi Method study also concluded, “good critical thinking has nothing to do with political correctness, or any given set of ethical values or social mores” (Facione 9).

The Delphi Method panel of experts clarified critical thinking in other ways. The experts said that creative or innovative thinking is the kind of thinking that leads to fresh ideas, new perspectives, novel approaches, and new insights (Facione 10). The experts listed the products of creative thought as music, poetry, dances, writings, and inventions. They defined *purposive* or *kinetic thinking* as “coordinating movement such as when the tailback in a football game runs

the ball down the field during a game”(Facione 11). *Meditative thinking* may lead to inner human peace or astute insights about existence. *Instinctive* or *hyper-alert thinking* is that thought process as needed when soldiers are in war and fighting battles. “Different kinds of positive thinking are needed in different circumstances or for different purposes” (Facione 11).

### **The Value of Critical Thinking**

Critical thinking is of value (Facione 11). Not only does it lift self-esteem and parallel higher scores on standardized tests, but also it improves humans because it liberates (Geertsen 6). Critical thinking goes beyond what is already known and helps humans to strive to make individual and group contributions to society. It enhances thinking for yourself, by yourself, and with others. Critical thinking finishes with reflective judgment. What if judges let their biases and stereotypes rule and govern their decisions? What if politicians could only see one way and not attempt to please the different groups of people? The impact of abandoning critical thinking during World War II may have had bearing on the decisions that brought about the destruction of many Jewish citizens of Europe. The outcome of a lack of critical thinking among a culture of people might have brought about the collapse of the Twin Towers in New York City. How long did it take this culture to devalue critical thinking and produce such results? Does this mean that Americans should be required to learn skills of critical thinking? Should we, as Americans, not see the merits of critical thinking? Is it any wonder that businesses and civic leaders are even more interested in teaching critical skills of thinking to students? What about the teachers? Is it true that only people with critical thinking skills have the knowingness to teach the development of such skills to students? Can we as Americans continue to overlook the positive effects of critical thinking skills? (Facione 17)

USA Today Magazine reported in November of 1999 that the current generation of students was falling behind in five crucial areas (Jennings 1-6). One of the five areas was critical

thinking. They reiterated, “most public school students are incapable of independent thought” (Jennings 3). Students, the author declared, are not able to think clearly or make rational, well-informed judgments (Jennings 3). The magazine reported that an Idaho High School freshman, Nathan Zohmer, conducted an experiment during a science class. The experiment reveals the nature of the problem. Zohmer asked other students to sign a petition banning a dangerous substance called dihydrogen monoxide (Jennings 3). This chemical supposedly caused excessive vomiting and sweating. He informed them of several effects that such a substance could have on the environment and what could happen if the substance were inhaled. Forty-seven of the 50 teachers and students signed the petition without questioning it. No one asked what the substance was. Had they done this, they would surely have discovered that there was no need to sign. The dangerous chemical was H<sub>2</sub>O - water! Maybe it is time for the United States of America to reclaim the youth by beginning the process of teaching critical thinking (Jennings 3).

In 1998, before his death, Bill Readings finished writing a book entitled, *The University in Ruins*. He contended that university academics no longer foster a climate of intellectual discourse. Instead, they are limiting educational expansion. He exhorts the public to check and, if his contention is true, he wants John Q. Public to pressure the universities to broaden their participation and understanding of other fields. Such an endeavor would intellectually challenge interchanges between faculty and students. Students entering the workforce and society after graduation would be equipped with critical thinking skills (LaCapra 1998).

### **Current Studies Involving or Describing Critical Thinking Skills**

There are many studies in the critical thinking skills area. Some studies in critical thinking have been documented which parallel the occupations of nursing, management applicants, clergy salesmen, policemen, and other miscellaneous occupations (Watson and Glaser Manual 8.1).



Five studies by Bruce Torff and Edward C. Warburton assessed the beliefs of teachers concerning classroom use of critical thinking. For the purposes of this study, the researcher will be describing the first three of the studies. The scores were examined and described according to reliability and validity (Torff and Warburton 155). The purpose of the instrument that they created, The Critical Thinking Belief Appraisal, using 20 open-ended story starts was to “identify differences among teachers in beliefs about the conditions under which they deem it effective to engage students in critical thinking-rich and / or critical thinking/ lean activities” (Torff and Warburton 155). The story starts in the Appraisal section of the instrument giving brief descriptions of classroom activities set in secondary-level core academics. The story starts and descriptions focus on English, bilingual languages other than English, mathematics, science, and social studies. A balance between high critical thinking and low critical thinking (story) starts was included, as well (Torff and Warburton 157). The article by Torff and Warburton describes the two authors’ development of an instrument designed to explore related phenomena (Torff and Warburton 156). Construct and scale were created and, as was stated earlier, validity of the scale’s scores were assessed.

Perceptions among teachers show that teachers tend to think critical thinking-rich activities benefit higher-level students more than medium or low-level students (Torff and Warburton 156). On the other hand, when student levels are low, teachers think students are unaffected by critical thinking-high level activities (Torff and Warburton 156). Torff and Warburton state that reliability has been proved, but validity was not. Furthermore, they add that validity is relatively unexamined in critical thinking studies. They explain that the advantage effect is the examination of predictive validity of a measure of critical thinking-use beliefs seems warranted.

The authors used advantage levels in this particular study. Torff and Warburton divided the levels into two groups: low and high advantage. To do this, they used certain criteria:

to identify whether a student was high or low, the authors used three characteristics: ability or the “learners” capacity for intellectual or academic achievement when dealing with the specific topic to which a given prompt refers, prior knowledge or “the extent of learners’ knowledge about the specific topic to which a given prompt refers before learners participate in additional activities,” and, finally, motivation or how much interest and attention learners demonstrate when dealing with the specific topic to which a given prompt refers (156).

These characteristics were decided when the authors deduced the characteristics were indicative of the teachers’ judgments. A three-characteristic (ability, prior knowledge, motivation) design with 120 items decreased response bias by the nature of the instrument. Twenty prompts for each of the six divisions – high ability, low ability, high prior knowledge, low prior knowledge, high motivation, and low motivation – with a six point Likert-type scale was used (Torff and Warburton 158).

In Study One of Torff and Warburton’s study, three procedures were completed, a criterion of ambiguity was “applied to evaluate the extent to which the 20 prompts actually reflect high- critical thinking and low – critical thinking activities. Secondly, an irrelevance criterion was applied to eliminate an item that “failed to discriminate between groups known to different beliefs about classroom use of critical thinking activities.” (Torff 158-6) And, lastly, a criterion of “internal consistency was applied to delete any item” that had not met all of the criteria, but had low internal consistency reliability relative to the items with which it was expected to succeed (Torff and Warburton 158-164).

Twenty university professors at Hofstra University in the School of Education and Applied Human Services were introduced to the prompts. They were asked to administer the prompts in order to assess whether or not these prompts would successfully reflect high- or low-critical activities. Because the prompts were separated by categories, “one hundred per cent of

the 400 judgments made by the participants correctly classified the prompts” (Torff and Warburton 158).

In Study One, principals were asked to nominate one teacher who was judged to strongly favor one of the levels of critical thinking use. Among the critical thinking- inclined teachers, there were eight males and twelve females. These persons averaged in teaching experience from eight to twenty-nine years. They had averages of 39.9 years of age and 13.1 years ranging from eight to twenty-nine years of teaching experience. These teachers included five teachers of English, three bilingual language teachers, four mathematics teachers, five teachers of science, and three social studies teachers. The other group was the “critical thinking-averse” teachers. In this division were nine males and eleven females who averaged in an age of 41.4 years and had a mean of 12.4 years of teaching experience with a range of seven to thirty years. This group included four teachers of English, two in languages other than English, five math teachers, four science teachers, and five social studies teachers (Torff and Warburton 2005). Teachers and administrators were asked to volunteer for the study. All who were asked participated. No one declined to participate. These participants were not monetarily compensated. The 120-item pool was given at schools where teachers were employed. The teachers were informed about confidentiality. In addition, they were told that there were no incorrect answers (Torff and Warburton 159). A MANOVA (multivariate analysis of group membership) was calculated on the dependent variables of high ability, low ability, high prior knowledge, low prior knowledge, high motivation, and low motivation.

An ANOVA that was run on the two groups produced divergent scores on the 36-item scale. The ANOVA showed that critical thinking – inclined teachers favoring high critical thinking and critically thinking adverse teachers preferring low critical thinking ones produced divergent scores. The difference was statistically different. The significance in the critically-

incline teachers where  $M = 5.38$  and the standard deviation was 0.56 and the critical thinkers who were adverse with  $M = 2.47$  and the standard 0.94 with  $F(1, 38) = 68.59$ ,  $p$  is less .0001 (Torff and Warburton 160).

Tests of internal consistency showed that there was interrelatedness among the 36 selected items. This is “where such” interrelatedness is expected given the theoretical distinctions drawn between high versus low critical thinking use and high versus low learner advantages (Torff and Warburton 160). Based on item averages, the overall alpha level for the scale was .89 (Torff and Warburton 160). Torff and Warburton found that:

- a) Satisfactory levels of internal consistency were obtained among the items measuring,
- b) high critical thinking prompts for high-advantage learners ( $\alpha = .91$ ),
- c) high critical thinking prompts for low-advantage learners ( $\alpha = .79$ ),
- d) low critical thinking prompts for high-advantage learners ( $\alpha = .96$ ), and
- e) low critical thinking prompts for low-advantage learners ( $\alpha = .92$ ) (160).

The Second study's purpose was to define factors, which motivate teachers' critical-use beliefs (Torff and Warburton 164). This study dealt with a more homogeneous group of secondary teachers. The authors believed that the items would reveal a salient pattern and structure coefficients that would show a tendency among teachers to support critical-rich and critical-lean activities according to the same advantages as were recognized in study 1 (Torff and Warburton 164). A population of 381 practicing teachers in New York, Connecticut, and Massachusetts was selected for this report. They were randomly picked from 39 secondary schools. Among the population, there were 199 females who had a mean age of 37.7 years and 182 males with a mean age of 38.6 years. Participants in this study had to have a minimum of 5 years of teaching experience. The mean average of 7 to 35 years experience was 13. Seven years in the population were 23 business teachers, 49 English teachers, 25 fine arts teachers, 25 fine arts, 27 health teachers, 42 foreign language 55 mathematics, 48 music 47 science, and 65 social studies teachers. No teacher was compensated for his/ her participation and, yet, all

teachers decided to participate. All of the selected random population participated by completing the 36-item CTBA at their respective schools. The examiner's instructions stated that there were no "right" answers and the study results were to be kept strictly confidential (Torff and Warburton 164-165).

Plans for the methodology were to first use principal axis factoring to summarize and evaluate the number of factors, presence of outliers, absence of multicollinearity and factorability of the scale (Torff and Warburton 164).

The Kaiser-Meyer-Okin, instrument to measure samples and was used. Varimax rotation was chosen after an oblique factor rotation was tried the highest correlation obtained was 25, which was below the .32 inclusion in factor rotation described by Tabachnick & Fedell (Torff and Warburton 165). These factors described 62% of the variance and the factors showed a correlation with the original aims of the instrument. The initial purpose was to assess teachers' perceptions about the learners' advantage level. On the opposite side, the 5<sup>th</sup> and 6<sup>th</sup> factors described only 8% of the variance and were not useful in application. Because of this, the 5<sup>th</sup> and 6<sup>th</sup> factors were excluded from further analyses in this second study (Torff and Warburton 165).

In the Third study, the CTBA was given to a group of pre-service secondary teachers who had little or no service years of teaching (Torff and Warburton 2005). Because they had small or unimportant service in the teaching field, the authors believed the inexperienced teachers' opinions would be different from those of the experienced teachers toward critical thinking. Three hundred and eight "undergraduate-level pre-service teachers" were involved in this study (Torff and Warburton 168-69).

At the three postsecondary institutions of Hofstra, Adelphia, and Dowling on Long Island, New York, a randomly selected population was selected for the third study. Of this

random sample, one hundred and sixty-one female individuals and one hundred and forty-seven male participants who had mean age average of twenty-one and two-tenths years took the CTBA. Included in this group are one business teacher, fifty-six English teachers, twenty-five fine arts teachers, twenty-seven health, thirty-eight foreign languages, forty-six mathematics, thirty music, thirty-one science, and fifty-four social studies pre-service teachers (Torff and Warburton 168). All who were asked to participate took part and no participants were compensated. All of the tested population completed the thirty-six-item CTBA. As with the other studies, the oral instructions emphasized that there were no incorrect answers and that the results would be reported in an anonymous fashion, with all confidentiality shown. A factor analysis was completed in this study as was done in Study 2. Torff and Warburton found similar conclusions in this 2005 study as was found in the previous study (168).

In a study by Grosser and Lombard of one hundred and fourteen prospective first-year student teachers studying for a B.Ed. at a South African university, the researcher found that “a considerable number of the sample of prospective teachers are not yet functioning on Grade 12 level with regard to the execution of critical thinking skills” (11). A study on critical thinking skills by Holmgren and Covin (321) entitled “Selective Characteristics of Pre-service Professionals” was done to examine critical thinking abilities and interpersonal values of three groups of pre-service educational workers. The subjects were sixty Caucasian seniors majoring in education. Twenty-five were elementary education majors. Twenty-five were special education majors and ten were in speech correction. The researchers found that the best predictors of scores were the *Watson-Glaser Critical Thinking Skills Tests*’ raw scores and age. The scores of the groups were compared using one-way analysis of variance. Education, ethnic background, and professional aspiration were not examined. All participants in the study came from a small rural community in the same geographic community in the same geographic section

of the country. The sex variable only had two male participants. The researchers recommended using the *Watson-Glaser Critical Thinking Appraisal Test* as a screening criterion for prospective teacher candidates (Holmgren and Covin 321).

Pithers and Soden described a study on critical thinking using the *Smith-Whetton Critical Reasoning Test*. The study involved 256 Scottish and Australian university students studying education. In this investigation, there was “no significant between-group CRT differences for graduate versus non-graduate students” (240). They further report that the scores for the graduates were not significantly higher than non-graduates (Pithers and Soden 240). Pithers and Soden also report that there is evidence that students are entering universities with underdeveloped abilities to think critically (240). They point out that there is no “one correct program for critical thinking” (242).

Lorenzo Cherubini studied teachers at the College of Teachers in Ontario, Canada (228). These teachers represent the province’s educational community and are responsible for standards that define the teaching profession. The sample included eighty-five third year undergraduate students who were enrolled in the education program. The students (middle and high school pre-service teachers) were in a five-year program in the Ontario University. Case studies for case-inquiry studies were conducted. Students in the study were expected to keep daily journal reflection logs. One thousand three hundred and thirty-six logs were examined. Data was interrogated using a rubric based on a social constructivist theory. Such inquiry in the study fostered self-reflection (229). Results of the study showed an evolving self-confidence when students made decisions based on the standards defining the teaching profession and a growth in social cohesion among the pre-service teacher relationships (Cherubini 230). Cherubini notes that changing perspectives from the personal philosophies at the beginning of the study to more team-oriented ideas at the end of the study were shown in the daily journals (232).

In a post-apartheid study by Michele Stears in South Africa, a class of 45 sixth graders from a former township in the Western Cape was selected for a case study. The researcher taught over a four-day period using principles of social and critical constructivism and the classroom teacher acted as an observer. Activities were learner-centered and drew on the students' experiential backgrounds (Stears 1). Among the conclusions, Stears noted that the constructivist principles not only enhanced critical thinking, but allowed for personal and social needs to be addressed in the teachings (397).

Giancarlo, Blohm, and Urdan report on the development of a new critical thinking instrument, the California Measure of Mental Motivation (347). The CM3 is a tool to assess high school students' dispositions toward critical thinking. Over a period of two years, they conducted four independent studies. Stage 1 was the initial pilot investigation. 1,378 students in middle school and high school grades 6-12 participated in the pilot representing nineteen school sites from ten U.S. states. In the second stage, the researchers were to evaluate the validity and reliability of the CM3. This stage included male and female public school students from diverse ethnic backgrounds (Giancarlo et.al.350). Researchers compared CM3 scores to the students' academic grade point averages and standardized test scores. Stage 3 followed the same pattern as Stage 2, but instead tested predominantly Caucasian females who attended private college preparatory schools in the Midwest. Stage 4 again followed the same procedures, but testees were a group of high school students from diverse backgrounds (350). The results in the four studies provided evidence that the CM3 is a "viable measure of the disposition toward critical thinking for use with adolescent student samples" (Giancarlo et.al.360). The researchers reported that "it was not possible to determine whether sample characteristics could account for the difference, or whether the results were more indicative of problems inherent to the instrument



being developed” and that “further investigation will need to be done to resolve these discrepancies” (Giancarlo 361).

Helena Osana and Jennifer Seymour, in a cognitive apprenticeship learning community at the Department of Education, Concordia University in Montreal-Quebec, Canada and the Department of Curriculum Instruction of Iowa State University in the USA, created a detailed rubric based on literature in argumentation (473). This rubric was designed to assess student’s conceptions and use of evidence, notions about research, and their abilities to consider different perspectives, thus showing critical thinking abilities (Osana and Seymour 473). As an outcome of their study, the authors transformed two middle school classrooms into microcosms of real communities and implemented a three-week instructional intervention with a purpose of directing the students on how to use scientific concepts to provide evidence supporting national issues (Osana and Seymour 473). Goals of the two researchers promoted critical thinking skills through various forms of literacy, argumentation, and reflection. The instructors used one class session to model the use of an instruction piece, which was for discussion. The instruction piece was an essay centered on providing support for a specific hypothesis. The instructor showed evidence for each supporting detail that was given. The instructors to coach the classes through collaborative critique used two class sessions and there were whole-class discussions with a summary of collaborative critiques. The third through the tenth classes were used for scaffolding and fading when students presented and critiqued others with a whole-class analysis of student discussion for closure (Osana and Seymour 482). Although this was used in middle school, the activity could also be used in high school and in university settings. One of the goals of the study was to” test the theory of cognitive apprenticeship as a vehicle for delivering postsecondary instruction in a teacher education setting (Osana and Seymour 494).

## Summary

As Tim Van Gelder says in *College Teaching*, “everyone agrees that one of the main goals in education, at whatever level, is to help develop general thinking skills, particularly critical-thinking skills”(41). He also adds, “we need to generally improve our teaching and our educational systems. But, in what ways? What enhancements would best promote the development of critical-thinking skills?”(Van Gelder 41). Van Gelder encourages looking to the interdisciplinary science of thinking for the answer (Van Gelder 41). He concludes that the practical wisdom of teachers needs to be “accumulated, both as a profession and as experienced individuals” (Van Gelder 41). Linda Darling-Hammond concludes that “communities especially in high-poverty urban and rural locations, schools already report difficulties in recruiting qualified teachers in critical subject areas such as physical science, mathematics bilingual education, and special education” (1). Darling-Hammond issues a plea, too, for more teachers of color to reflect a teaching force that is diverse (1). She states that “only very knowledgeable and skillful teachers who are able to respond appropriately to students’ needs can enable diverse learners to succeed at these much more challenging learning goals” (1).

Holmgren and Covin have the right idea – to select the best possible qualified candidate for the teaching profession by screening the applicants with the WGCTA (321). To develop and maintain the best teaching programs, Louisiana and the USA should make certain that the best classroom environments are available to our students. Willingham says that, “The call is not new. Schools must do a better job of teaching critical thinking skills” (Willingham 8). To sum it up rather briefly, as Merriam and Cunningham’s edited book says, “The teaching of critical thinking begins with educators who are themselves critical thinkers” (Merriam and Cunningham 1989).

### **CHAPTER THREE: METHODOLOGY**

The primary purpose of this study was to determine the influence of selected personal and professional demographic characteristics on the critical thinking abilities of currently employed teachers in a parish in Southwest Louisiana. The following specific objectives were formulated to guide the researcher:

1. To describe currently employed public school teachers in a parish in Southwest Louisiana on the following selected personal and professional demographic characteristics:
  - a. Gender,
  - b. Race,
  - c. Age,
  - d. Highest level of education completed,
  - e. Grade level(s) taught,
  - f. Subject(s) taught, and
  - g. Years of teaching experience.
2. To describe public school teachers in a parish in Southwest Louisiana on their critical thinking abilities as measured by the Watson-Glaser Critical Thinking Appraisal Short Form.
3. To determine if a relationship exists between the critical thinking abilities (as measured by the Watson-Glaser Critical Thinking Appraisal Short Form) of public school teachers in a parish in Southwest Louisiana and the following personal and professional demographic characteristics:
  - a. Gender,
  - b. Race,

- c. Age,
  - d. Highest level of education completed,
  - e. Subject(s) taught, and
  - f. Years of teaching experience.
4. To compare the critical thinking abilities (as measured by the Watson-Glaser Critical Thinking Appraisal Short Form) of public school teachers in a parish in Southwest Louisiana by the level of their current primary teaching assignment (defined as elementary, middle, or secondary).
5. To determine if a model exists explaining a significant portion of the variance in critical thinking abilities (as measured by the Watson-Glaser Critical Thinking Appraisal Short Form) of public school teachers in a parish in Southwest Louisiana from the following personal and professional demographic characteristics:
- a. Gender,
  - b. Race,
  - c. Age,
  - d. Highest level of education completed,
  - e. Grade level(s) taught (defined as elementary, middle, or high school),
  - f. Subject(s) taught, and
  - g. Years of teaching experience.

### **Research Design**

This research study included an ex post facto research design using a descriptive survey technique. The researcher studied the teachers' critical thinking abilities after having described the teacher characteristics of age, race, degrees, and ethnicities. The examiner looked at attribute independent variables - characteristics that a subject has before a study begins (Ary, Jacobs,

Razavieh 2002). Such causal comparative research “investigates cause and effect relationships between independent and dependent variables” (Ary, Jacobs, Razavieh 2002). In a way, the ex post facto research design is the opposite of experimental design because ex post facto starts with groups that are already different and tries to determine the antecedents of these groups

### **Population and Sample**

The target population for this study was defined as currently employed teachers in the public schools in Louisiana. The accessible population was defined as currently employed teachers in one selected parish in Southwestern Louisiana. The sampling plan for the study consisted of the following steps:

1. A list of all the schools in the parish was prepared which included all schools that were classified in one of the three school levels (elementary, middle, and high). Schools that included multiple levels of grades (e.g. elementary and middle or K-12 schools that include all three levels) were omitted from the study since one of the variables of investigation was school level.
2. The list of schools was stratified by school level (elementary, middle, or high).
3. A random sample was drawn from each of the levels to include the following:
  - a. A random sample of five of the 26 elementary schools in the parish was selected;
  - b. A random sample of four of the 13 middle schools in the parish was selected; and
  - c. A random sample of three of the nine high schools in parish was selected.
4. The minimum useable number of responses was determined using Cochran’s sample size determination formula as follows:

$$N_0 = \frac{(t^2)(s^2)}{d^2}$$

If the minimum number of useable responses ( $n = 157$ ) was not attained from the schools randomly selected, additional schools were to be randomly selected from each school level until the minimum number of responses was reached. (Three hundred and twenty-four participants were identified in this research.)

### **Instrumentation**

Data for this study was collected using two instruments. These instruments included:

1. The Watson-Glaser Measure of Critical Thinking Ability Short Form Test, and
2. A researcher designed demographic instrument.

#### Watson-Glaser Critical Thinking Appraisal Short Form

The *Watson-Glaser Critical Thinking Appraisal Short Form* was designed to measure important abilities found when one has critical thinking skills. Five tests are part of the Watson-Glaser: inferencing, recognizing assumptions, deducing conclusions, making interpretations, and evaluating arguments. Each of the tests has a battery of reading passages, or scenarios that include problems, statements, arguments, and interpretations, which correlate to situations that bear a similarity to those one might encounter at work (Watson-Glaser Manual 3). Although there are five tests in the Short Form, it is not considered valid without the total score. That sum (raw score) yields a reliable measure of critical thinking ability (Watson-Glaser Manual 4). There are two types of content in the items, *neutral* and *controversial*. Neutral scenarios are those that are not controversial. These might be such topics as the weather, or scientific facts or experiments. The test was published in 1994 and is used to assess adults for employment, college students for identification of critical thinking skills, and students in vocational and technical schools, and students in adult education programs. In addition to assessing employees, Watson-Glaser is used extensively for critical thinking instruction programs and courses, for placing gifted and talented programs at the high school level, and in the honors curriculum at the

university level (Watson-Glaser 3). It is an abbreviated form of the earlier *Watson- Glaser Form A*. The earlier forms of the Critical Thinking Appraisals by Watson and Glaser first came in the year 1925 by Goodwin Watson and, in 1937, by Edward Glaser. These early instruments, each containing eighty items were published as Forms A and B. Those tests take approximately one hour of administration and the Short Form takes about 30 minutes. The Short Form is appropriate for those persons who are on at least the equivalent of a 9<sup>th</sup> grade level (Watson-Glaser 4).

Standard examination procedures should be taken during the administration of the Watson-Glaser. These include “good lighting, comfortable seating, adequate desk or table space, and freedom from noise or distractions” (Watson-Glaser 5). Regular testing materials, such as the number two pencils, are to be used. The Watson-Glaser may be either timed or untimed. At the end of the test, all of the documents should be collected and properly organized for the next testing period.

The raw score on the Watson-Glaser was the number of correct responses. Raw scores were then related to normative groups. A representative number of cases, which is 100 or more, should be used to guide the interpretation of the scores. Raw scores were then compared to norm groups and then converted to percentile ranks.

### **Data Collection**

First, the parish superintendent was contacted and asked about permission to conduct the research. The parish superintendent granted this request and added his verbal support to the study. A research committee of the School Board had given official permission from the parish school system. The researcher told the parish superintendent that several of the schools in the parish school system would be selected by a random method in order to secure a valid representation of the population.

Next, after the selection had been made, the researcher contacted by email, phone, or in

person, each principal whose school was selected in order to schedule a time to meet with the faculty for administration of the *Watson-Glaser Critical Thinking Appraisal Short Form*.

Principals were assured of the anonymity involved in the research process.

At the faculty gatherings, the researcher briefly went over the demographically designed instrument and the directions for the Watson-Glaser Short Form. After doing so, she then administered both of these. Codes were to be placed on the answer documents and the same matching code was used on the Watson-Glaser Short Form Answer Document.

Once this was done, the researcher checked the instruments and recorded the data. The researcher then checked the Watson-Glaser Short Form using the answer document and the check sheet furnished by Watson-Glaser.

After this procedure, the results were coded on each of the answer documents and the process described in the “Data Analysis” section was begun to find the results of the instruments using each statistical process as outlined.

#### Watson-Glaser Short Form Reliability

The reliability of the Watson-Glaser Short Form was expressed in a correlation coefficient (Watson-Glaser 27). The correlation coefficient stood for the consistency of scores that would be obtained if a test could be given an infinite number of times.

Cronbach’s alpha and the standard error of measurement were statistically calculated on some of the norm groups that had used the Short Form. From the findings, the reliability estimated for these samples (which included lower-level management applicants, upper-level management, sales applicants, clergy, and candidates for police captain) were in the ranges of .76-.85. It was suggested that the test scores should not be the lone indicator of critical thinking skills (Watson-Glaser 29). The Handbook by Watson-Glaser stated that, “no single test event ever measures an examinee’s actual ability with complete accuracy (Watson-Glaser 27).



### Watson-Glaser Short Form Validity

“Data from the Short Form sample was analyzed for evidence of validity based on content, test-criterion relationships, and evidence of convergent and discriminant validity” (Watson-Glaser 33). “Content-related validity evidence of the Watson-Glaser in classroom and instructional settings may be examined by noting the extent to which the Watson-Glaser measures a sample of the specified objectives of such instructional program” (Watson-Glaser 33). In order to evaluate the quality of the studies as far as test-criterion validity is concerned; it was essential to know the sample size and the criterion nature.

### **Data Analysis**

The first objective of the study was to describe currently employed public school teachers in a parish in southwest Louisiana on the following selected personal and professional demographic characteristics:

- A. Gender,
- B. Race,
- C. Age,
- D. Highest level of education completed,
- E. Grade level(s) taught,
- F. Subject(s) taught, and
- G. Years of teaching experience.

Data analysis used to accomplish this objective was basic descriptive statistics to provide a description on the study participants on each of the listed characteristics. Those variables that were measured on a nominal scale of measurement (gender, race, grade level(s) taught, and subject(s) taught) were described using frequencies and percentages in categories of measurement.

The second objective of the study was to describe public school teachers in a parish in Southwest Louisiana on their critical thinking abilities as measured by the *Watson-Glaser Critical Thinking Appraisal Short Form*. This variable provided a score that was measured on an interval level of measurement; therefore the data analysis to accomplish this objective included computation of the means and standard deviations of each of the scales and sub-scales measured in the Watson-Glaser document.

The third objective was to determine if a relationship existed between the critical thinking abilities (as measured by the *Watson-Glaser Critical Thinking Appraisal Short Form*) of public school teachers in a parish in Southwest Louisiana and the following personal and professional demographic characteristics:

- A. Gender,
- B. Race,
- C. Age,
- D. Highest level of education completed,
- E. Subject (s) taught, and
- F. Years of teaching experience.

The data analysis to accomplish this objective included appropriate correlation coefficients between each of the demographic characteristics and the Watson Glaser scores for the participants. The Pearson Product Moment correlation coefficient was used to measure the relationship between the demographic characteristics of age and years of teaching experience and the critical thinking abilities' scores.

The relationship between critical thinking abilities and the variables that were measured on a nominal level of measurement were examined using appropriate comparative statistical procedures. This was chosen as the preferred method for examining these associations to

facilitate the ease of interpretation of the study outcomes. For example, critical thinking scores were compared by the categories of the variable gender using the independent t-test procedure. Similarly, the one-way ANOVA procedure was used to compare the critical thinking scores by categories of the variables, race and subject(s) taught.

The fourth objective of the study was to compare the critical thinking abilities (as measured by the *Watson-Glaser Critical Thinking Appraisal Short Form*) of public school (certified) teachers in a parish in Southwest Louisiana by the level of their current primary teaching assignment (defined as elementary, middle, or secondary). This objective was accomplished by comparing the critical think ability scores by categories of the level of their current teaching assignment using the one-way ANOVA procedure.

The fifth objective of the study was to determine if a model existed explaining a significant portion of the variance in critical thinking abilities (as measured by the *Watson-Glaser Critical Thinking Appraisal Short Form*) of public school teachers in a parish in southwest Louisiana from the following personal and professional demographic characteristics:

- A. Gender,
- B. Race,
- C. Age,
- D. Highest level of education completed,
- E. Grade level (s) taught (defined as elementary, middle, or high school),
- F. Subject (s) taught, and
- G. Years of teaching experience.

This objective was accomplished using the multiple regression analysis procedure with the critical think abilities score(s) entered into the analysis as the dependent variable and the variables listed entered into the analysis as independent variables. Variables that were nominal

in nature were coded as a series of dichotomous (binary) variables as needed to facilitate their inclusion into the regression analysis. For example, subjects taught were recoded, as a series of dichotomous variables, such as whether or not the teacher's primary subject taught was social studies, etc.

## **CHAPTER FOUR: RESULTS**

The primary purpose of this study was to determine the influence of selected demographic and professional characteristics and factors on the critical thinking skills of public school teachers in a parish in Southwest Louisiana.

The target population for this study was defined as currently employed public school teachers in a parish in Southwest Louisiana. The accessible population was defined as currently employed schoolteachers in one selected parish in Southwest Louisiana. The researcher defined public school teachers in Southwest Louisiana as being those persons employed by the selected school system that taught subjects in grades k-12. Thus, there were 121 elementary, 103 middle, and 100 high school teachers who provided useable data in response to the *Watson-Glaser Critical Thinking Appraisal Short Form Test* and the demographic questionnaire. A total of 324 were selected for the sample in this study. The selected parish has sixty-one elementary, middle, and high schools. Of this number of schools, five elementary, four middle, and three high schools were used in the sample. The twelve public schools yielded useable data from three hundred and four participants. This chapter presents the outcomes and results by objective.

### **Objective One**

The first objective of this study was to describe currently employed public school teachers in a parish in Southwest Louisiana on the following selected personal and professional demographic characteristics:

- (a) Gender,
- (b) Race,
- (c) Age,
- (d) Highest level of education completed,
- (e) Grade level (defined as elementary, middle, or high school),

- (f) Subject(s) taught (Areas of Content), and
- (g) Years of teaching experience.

The results for each of the variables as expressed in the objective are reported in the following sections.

### Gender

The first variable on which the teachers were described was gender. Of the 324 public school teachers who were participants in the study, 51 (15.8%) were identified as males and 272 (84.2%) were identified as females. One person refused to identify his or her gender.

### Race

Another variable on which the subjects were described was their race. Of the 324 public school teachers in a parish in Southwest Louisiana who participated in the study, the largest group as reported on the variable Race was the Caucasian (n =286, 88.5%) group. The race that was reported by the second largest group of participants (n=32, 9.9%) was African-American (see Table 1).

<b>Table 1.</b>		
<b>Race of Public School Teachers In a Parish in Southwest Louisiana</b>		
<u>Race</u>	<u>Frequency</u>	<u>Percent</u>
Caucasian	286	88.5
African-American	32	9.9
Hispanic	3	0.9
American Indian	2	0.6
Total	323 <sup>a</sup>	100.0

<sup>a</sup> One of the participants did not identify his or her race.

### Age

A third variable on which the subjects were described was age. Of the 324 participants in the study, 315 responded to this item. The ages of these respondents ranged from 22 to 71 years, and the mean age was 40.51 (SD = 11.514). To further describe the participating teachers on the

variable age, the researcher divided the subjects into age categories. These categories were selected by the researcher and included: 30 or less, 31-40, 41-50, 51-60, and 61 or more. The age category that included the largest number of the teachers was the “31 – 40” category (n = 100, 31.8%). The age category within which the smallest number of teachers reported their age was “61 or more” (n = 14, 4.4%) (see Table 2).

<b>Table 2.</b> <b>Age of Public School Teachers in a Parish in Southwest Louisiana</b>		
<u>Category</u>	<u>Frequency</u>	<u>Percent</u>
30 or less	75	23.8
31-40	100	31.8
41-50	68	21.6
51-60	58	18.4
61 or more	14	4.4
Total	315 <sup>a</sup>	100.0
Note. Mean age was 40.51 years (SD = 11.514) and ages ranged from 22 to 71		
<sup>a</sup> Nine of the subjects or 2.8% did not identify themselves on their age.		

#### Highest Level of Education Completed

A fourth variable on which the subjects were described was the highest level of education completed. Three hundred and twenty-two participants identified themselves on their highest level of education completed. Of this number, the largest group was those persons describing themselves as having bachelors’ degrees (n=216, 67.1%) (see Table 3).

<b>Table 3.</b> <b>Highest Level of Education Completed by Public School Teachers in a Parish in Southwest Louisiana</b>		
<u>Education Level Completed</u>	<u>Frequency</u>	<u>Percent</u>
Bachelors	216	67.1
Masters	71	22.1
Masters Plus 30	32	9.9
Specialist	3	.9
Total	322 <sup>a</sup>	100.0
<sup>a</sup> Two persons did not identify their highest level of education completed.		

#### Grade Level Taught

Another variable on which the teachers were described was the grade level, defined as elementary, middle, or high school, at which they taught. Elementary teachers consist of those

teachers who teach in grades K-5. Middle school teachers are those who teach in grades 6-8, and high school teachers are those teachers who teach in grades 9-12. Of the 324 teachers who participated in the study, the level at which the largest group taught was elementary (n = 122, 37.6%). The second largest group was teachers at the middle school level, which included 102 (31.5%) participants (see Table 4).

<b>Table 4.</b> <b>School Levels Taught of Public School Teachers in a Parish in Southwest Louisiana</b>		
<u>Level Taught</u>	<u>Frequency</u>	<u>Percent</u>
Elementary	122	37.6
Middle	102	31.5
High	100	30.9
Total	324	100.0
Note: Mean years of experience = 12.14 (SD = 9.47) and ages ranged from 0.5 to 42 years		

#### Years of Teaching Experience

Years of teaching experience was another variable on which the teachers who participated in the study were described. In terms of the total number of years of teaching experience, the respondents were asked to include years of teaching experience in their response, including the current year. The mean years of experience reported by the participants was 12.14 (SD = 9.47). The years of experience ranged from one-half years to forty-two years. To further describe the respondents, the researcher grouped the years of teaching experience into the following categories of response: less than 3 years, 3 to 9 years, 10-19 years, 20-29 years, and 30 or more years. Of the 324 teachers, those who had less than three years experience numbered 49 (15.1%). The response category that included the largest number of respondents was the “3 to 9” years of experience category (n = 112, 34.6%) (see Table 5).

#### Subjects Taught (Areas of Content)

All of the respondents in the study were asked to indicate from a list of provided subject areas whether or not they considered that subject to be their (or one of their) primary areas of



content. These data were summarized separately for each of the three primary grade levels of schools (elementary, middle, and high). Therefore, elementary teachers were provided with the subject areas of reading, math, social studies, science, and other. They were asked to indicate for each of these five areas if they considered it to be their (or one of their) primary subject(s) taught.

<b>Table 5.</b> <b>Years of Experience of Public School Teachers in a Parish in Southwest Louisiana</b>		
<u>Years of Experience</u>	<u>Frequency</u>	<u>Percent</u>
Less than 3	49	15.1
3 to 9	112	34.6
10-19	94	29.0
20-29	41	12.7
30 or more	28	8.6
Total	324	100.0
Note: Mean years of experience = 12.14 (SD = 9.47), and ranged from 0.5 to 42 years		

#### Elementary Teachers

The subject that was identified as a primary subject taught by the largest number of elementary teachers (n= 81, 66.9%) was “Reading” (English Language Arts). The subject that was identified by the second largest number of teachers (n=32, 26.4%) was “Mathematics” (see Table 6).

<b>Table 6.</b> <b>Frequency of Elementary School Teachers in a Parish in Southwest Louisiana Who Reported Selected Subjects as a Primary Content Area</b>		
<u>Areas of Content</u>	<u>Frequency</u>	<u>Percent<sup>a</sup></u>
Reading	81	66.9
Math	32	26.4
Social Studies	26	21.5
Science	26	21.5
Other <sup>a</sup>	21	17.4
Total	186 <sup>b</sup>	
<sup>a</sup> The 21 or 17.4 % who specified “Other” as a primary content area included: special education (n=6), music (n=1), librarians (n=2), pre-K (n=3), counselor (n = 1,) lead teacher (n=1), and foreign language (n=1), six who did not specify an area.		
<sup>b</sup> Percentages do not sum to one hundred since respondents were asked to indicate each area if it was a primary teaching area.		

### Content Area for Middle School Teachers

The subject that was identified as a primary subject taught by the largest number of middle school teachers (n = 29, 28.2%) was English-Language Arts (ELA). The subject that was identified by the second largest number of teachers was mathematics (n=24, 23.3%) (see Table 7).

<b>Table 7</b> Frequency of Middle School Teachers in a Parish in Southwest Louisiana Who Reported Selected Subjects as a Primary Content Teaching Area		
<u>Areas of Content</u>	<u>Frequency</u>	<u>Percent<sup>a</sup></u>
ELA	29	28.2
Math	24	23.3
Social Studies	18	17.5
Science	20	19.4
Foreign Language	04	3.9
Other	14	13.6
Total	109 <sup>a</sup>	
<sup>a</sup> Percentages do not sum to one hundred since respondents were asked to indicate for each area if it was a primary teaching area.		

<b>Table 8.</b> Frequency of High School Teachers of a Parish in Southwest Louisiana Who Reported Selected Subjects as a Primary Content Area		
<u>Areas of Content</u>	<u>Frequency</u>	<u>Percent</u>
Social Studies	17	17.0
ELA	16	16.0
CTE	14	14.0
Business	05	35.7
Agriculture	04	28.6
Family & Consumer		
Science	02	14.3
Other	02	14.3
Tech Ed	01	07.1
Math	13	13.0
Science	11	11.0
Art	07	07.0
Foreign Language	02	02.0
Total	104 <sup>a</sup>	
Note: Some of the respondents reported multiple areas as their teaching areas.		
<sup>a</sup> Percentages do not sum to one hundred since respondents were asked to indicate for each area considered as a primary teaching area.		

### Content Area for High School Teachers

The subject that was identified as a primary subject taught by the largest number of high school public school teachers ( $n = 17$ , or 17%) was social studies. The subject that was identified by the second largest number of teachers was ELA ( $n = 16$ , 16.0% were ELA teachers). Of the people who checked Career Technical Education (CTE) as their primary teaching area, four were agriculture teachers, five were business teachers, two taught family and consumer science, and one taught technical education (see Table 8).

### **Objective Two**

The second objective of this study was to describe currently employed public school teachers in a parish in Southwest Louisiana on their critical thinking abilities as measured by the *Watson-Glaser Critical Thinking Appraisal Short Form*. For the purpose of this assessment, the responses to the *Watson-Glaser Critical Thinking Appraisal Short Form* were broken down in to five sub-scale scores: inference, recognition of assumptions, deduction, interpretation, and evaluation of arguments. To summarize the information from these assessments, the mean score for each of the sub-scales and the overall critical thinking ability score (which is derived as the sum of the five sub-scale scores) was computed. These mean scores are presented in Table 9. The sub-scale with the highest score was the “Evaluation of Arguments” sub-scale (mean = 6.50,  $SD = 1.431$ ), and the sub-scale with the lowest score was the “Inference” sub-scale (mean = 3.35,  $SD = 1.503$ ). Additionally, the overall critical thinking ability scores ranged from a low of 14 to a high of 40 with a mean score of 25.29 ( $SD = 4.557$ ). However, since the five sub-scales included as part of the instrument have varying numbers of items, examination of the mean sub-scale scores would be more meaningful if they were converted to a common scale. To accomplish this purpose, the number of items included in the sub-scale to convert it to a percentage basis divided each of the mean sub-scale scores. When this action was taken, the

sub-scale, which was found to have the highest score, was still the “Evaluation of “Arguments” sub-scale (mean = 72.2%). Additionally, the sub-scale with the lowest score was the “Inference” sub-scale (mean = 47.9%) (see Table 9). In addition to the raw scores for the overall critical thinking ability measurements, normative data was available for the “Education” occupational group. The researcher converted the raw score to equivalent percentile ranks. The percentile ranks for the overall measure ranged from a low of 1 to a high of 99 with a mean percentile rank of 26.41 (SD 21.260). Additionally, the percentile ranks were grouped in quartiles (see Table 10). The majority (n = 174, 53.7%) of the participants in this study were in the lowest quartile (1<sup>st</sup> to 25<sup>th</sup> percentile). The quartile within which the smallest number (n = 17, 5.2%) of participants was grouped was the highest quartile (76<sup>th</sup> to 99<sup>th</sup>) (see Tables 9 and 10).

**Table 9.**

Critical Thinking Ability Scores of Public School Teachers in a Parish in Southwest Louisiana

Critical Thinking Scale/Sub-scale	Mean	SD	Low	High	% Correct
Evaluation of Arguments	6.50	1.431	2	9	72.2
Recognition of Assumptions	5.40	1.980	0	8	67.5
Deduction	5.89	1.721	1	9	65.4
Interpretation	4.15	1.219	0	7	59.3
Inference	3.35	1.503	0	7	47.9
Overall	25.29	4.557	14	40	

**Table 10.**

Critical Thinking Ability Raw Scores and Normative Scores Grouped into Quartiles Among Public School Teachers in a Parish in Southwest Louisiana

Raw Scores (Correct items)	Quartile (Value)	Frequency	Percent
0-25	1(1-25 percentile)	174	53.7
26-30	2 (26-50 percentile)	107	33.0
31-33	3 (51-75 percentile)	26	8.0
34-40	4 (76-99 percentile)	17	5.2
Total		324	100.0

<sup>a</sup>When the categorized data with correct items is broken down into individual reporting by ranks of least correct to most correct, the norms produce a mean of 25.29 with a standard deviation of 4.557 (the lowest correct individual raw score yielded a result of 14 and the highest score was 40 or 100% correct).

### **Objective Three**

Objective Three was to determine if a relationship existed between the critical thinking abilities as measured on the *Watson-Glaser Critical Thinking Appraisal Short Form* for public school teachers in a parish in Southwest Louisiana and the following personal and professional demographic characteristics:

- (a) Gender,
- (b) Race,
- (c) Age,
- (d) Highest level of education completed,
- (e) Years of teaching experience,
- (f) Subjects (areas of content) taught.

In examining the relationship between critical thinking abilities and selected demographic characteristics, the statistical tests used to measure the relationship were selected based on the appropriateness for the level of measurement of each variable. Each selection was also made to maximize the interpretability of the results.

#### Gender

The first variable examined for a relationship with critical thinking ability as measured by the sub-scales of the *Watson-Glaser Critical Thinking Appraisal Short Form* Test was the variable gender. Since the variable gender is a dichotomous nominal variable, the researcher determined that the most effective method for examining this relationship was to compare the critical thinking ability measures by the categories of gender. The independent t-test statistical procedure was used to make these comparisons. When these comparisons were made, only one of the scales of the Watson-Glaser Critical Thinking measure was found to be significantly different between male and female teachers participating in the study. This scale was the

“Interpretation” sub-scale, and the nature of the difference between the groups was such that male teachers (M=4.69, SD =1.21) had significantly higher critical thinking ability scores than did the female teachers (M =4.06, SD =1.20) ( $t_{321}=3.43$ ,  $p=.001$ ). None of the other critical thinking ability sub-scale scores, or the overall score, was found to be significantly different by gender of participant (see Table 11).

<b>Table 11.</b> <b>Comparison of Critical Thinking Abilities of Public School Teachers in a Parish in Southwest Louisiana by Gender</b>					
Critical Thinking Scale	Gender	Mean	SD	t	p
Interpretation	Male	4.69	1.21	3.43	0.001
	Female	4.06	1.20		
Inference	Male	3.49	1.50	-0.79	0.43
	Female	3.31	1.50		
Evaluation of Arguments	Male	6.63	1.41	0.70	0.48
	Female	6.47	1.44		
Deduction	Male	5.78	1.63	-0.46	0.65
	Female	5.90	1.74		
Recognition of Assumptions	Male	5.31	2.22	-0.34	0.76
	Female	5.42	1.94		
Total	Male	25.90	5.34	1.064	0.29
	Female	25.26	4.34		

### Race

Another variable that was examined for its relationship with critical thinking ability as measured by the scales of the *Watson-Glaser Critical Thinking Appraisal Short Form Test* was “race.” While the variable “Race” included four categories of response in this study, two of these categories (“Hispanic” and “American Indian”) had such small numbers ( $n = 3$  and  $2$  respectively) that making statistical comparisons using these groups was not practical.

Therefore, given this situation, the comparisons to examine the relationship with the variable “Race” were limited to the “Caucasian” and the “African American” groups.

The independent t-test procedure was used to measure the differences in the two groups. When these comparisons were made, significant differences were found in four of the six scales including Deduction, Recognition of Assumptions, Inference and Overall Critical Thinking ability. On all of the scales for which a significant difference was found, Caucasian participants had higher scores (indicating higher levels of critical thinking ability) than African-American participants (see Table 12).

**Table 12.**  
**Comparison of Critical Thinking Abilities of Public School Teachers in a Parish in Southwest Louisiana by Race<sup>a</sup>**

<u>Critical Thinking Scale</u>	<u>Mean</u>	<u>SD</u>	<u>t</u>	<u>p</u>
Deduction				
Caucasian	6.02	1.659	-4.194	<0.001
African-Americans	4.72	1.764		
Recognition of Assumptions				
Caucasian	5.48	1.976	-2.664	0.008
African-Americans	4.50	1.849		
Inference				
Caucasian	3.41	1.516	-2.111	0.04
African-Americans	2.81	1.424		
Interpretation				
Caucasian	4.21	1.201	-1.914	0.056
African-Americans	3.78	1.099		
Evaluation of Arguments				
Caucasian	6.55	1.400	-1.717	0.087
African-Americans	6.09	1.711		
Total Scale				
Caucasian	25.66	4.454	-4.562	<0.001
African-Americans	21.91	4.091		

<sup>a</sup> n for Caucasians = 286; n for African-Americans = 32

### Age

Another variable examined for its relationship with critical thinking ability was “Age.” Pearson’s Product Moment Correlation Coefficients, computed between the age of participants and each of the six scales of the *Watson –Glaser Critical Thinking Appraisal Short Form Test*,

were used to measure these relationships. Results of these tests indicated that one of the critical thinking ability sub-scales (“Recognition of Assumptions”) was found to be related to the variable “Age” of participant ( $r = .20, p < .001$ ). The nature of this relationship was such that older teachers tended to have higher levels of critical thinking ability in the area of “Recognition of Assumptions.” None of the other critical thinking ability scale/sub-scale scores were found to be related to the variable “Age” (see Table 13).

**Table 13.**

Relationship between Critical Thinking Ability and Age of Currently Employed Public School Teachers in a Parish in Southwest Louisiana

Scale	r	p
Recognition of Assumptions	0.20	<0.001
Evaluation of Arguments	0.09	0.109
Inference	-0.09	0.129
Deduction	-0.06	0.307
Interpretation	0.01	0.872
Overall	0.07	0.231

Note: Nine persons did not specify age on the demographic instruments;  $n = 315$

#### Highest Level of Education

Another variable examined for its relationship with critical thinking abilities is higher level of education. The selections for highest level of education completed on the demographic instrument included GED, High School Diploma, Some College, Bachelors’ Degree, Masters’ Degree, Masters’ Plus 30 Certification, Specialist, and Doctorate. Spearman’s Rank Order Correlation Coefficients were used to determine these associations. Analysis of the data showed that there were no significant correlations between highest level of education completed and the critical thinking ability scale/sub-scale scores (see Table 14).

#### Years of teaching experience

Another variable examined for its relationship with critical thinking abilities is years of teaching experience. The Pearson’s Product Moment Correlation Coefficient statistical procedure was used to measure the relationship between the years of teaching experience and



**Table 14.**

Relationship between Critical Thinking Ability and Highest Level of Education Completed of the Public School Teachers in a Parish in Southwest Louisiana

<u>Scale</u>	<u>r</u>	<u>p</u>
Recognition of Assumptions	0.10	0.071
Evaluation of Arguments	0.07	0.191
Inference	0.01	0.817
Deduction	0.00	0.943
Interpretation	-0.04	0.442
Total	0.06	0.290

Note: Two persons did not respond; n = 322

critical thinking ability as measured by the scales of the *Watson-Glaser Critical Thinking Skills Short Form Appraisal*. Only one of the critical thinking ability scales (the Recognition of Assumptions sub-scale) was found to be significantly related ( $r = .16$ ,  $p = .004$ ) to the years of experiences of the teachers participating in the study (see Table 15).

**Table 15.**

Relationship between Critical Thinking Ability and Years of Teaching Experiences Of Public School Teachers in a Parish in Southwest Louisiana

<u>Scales</u>	<u>r</u>	<u>p</u>
Recognition of Assumptions	0.16	<0.004
Inference	-0.10	0.074
Evaluation of Arguments	0.08	0.162
Deduction	-0.04	0.459
Interpretation	-0.00	0.951
Total Scale	0.05	0.425

#### Subjects (Areas of Content) Taught in Elementary, Middle, or High School

Another variable, which was examined for its relationship with the Critical Thinking Ability scores among public school teachers in a parish in South Louisiana, was whether or not they identified selected instructional content areas as one of their primary content areas. Since the organization of content areas differs somewhat by school level (elementary, middle, and high). Each of the three levels was examined for these relationships separately.

#### Elementary English-Language Arts

The first level examined was the elementary school level, and the first content area to be

assessed was the English Language Arts (Reading). The statistical technique that was chosen to make this assessment was the independent t-test procedure comparing each of the critical thinking ability scales/sub-scales by whether or not the elementary teachers identified ELA (Reading) as a primary content area. When these comparisons were made, only one of the Critical Thinking Ability scores (“Evaluation of Arguments”) was found to be significantly different by whether or not the teacher identified ELA as a primary content area ( $t_{119} = 2.298$ ,  $p = .02$ ). Elementary teachers who identified ELA as a primary content area (mean = 6.36, SD = 1.443) had significantly lower “Evaluation of Arguments” critical thinking ability sub-scale scores than elementary teachers who did not identify ELA as a primary content area (mean = 6.98, SD = 1.271) (see Table 16).

<b>Table 16.</b> <b>Comparison of Critical Thinking Ability of Elementary Teachers by Whether or Not They Identified English Language Arts as a Primary Teaching Content Area</b>						
<u>Scale</u>	<u>N</u>	<u>df</u>	<u>M</u>	<u>SD</u>	<u>t</u>	<u>p.</u>
Inference						
Not <sup>a</sup>	40 <sup>b</sup>	119	3.15	1.406	0.053	0.96
Yes	81 <sup>c</sup>		3.14	1.367		
Recognition of Assumptions						
Not	40	119	5.20	2.151	-0.18	0.86
Yes	81		5.27	2.00		
Deduction						
Not	40	119	5.60	1.722	-0.69	0.50
Yes	81		5.83	1.716		
Interpretation						
Not	40	119	4.02	1.143	-0.46	0.65
Yes	81		4.12	1.100		
Evaluation of Arguments						
Not	40	119	6.98	1.271	2.3	0.02
Yes	81		6.36	1.443		
Total						
Not	40	119	24.95	4.782	0.28	0.78
Yes	81		24.72	4.019		
<sup>a</sup> Not teaching the content area (subject)						
<sup>b</sup> Number of participants in the sample who were not teaching the content area						
<sup>c</sup> Number of participants in the sample who were teaching the content area						

### Elementary Mathematics

The statistical technique that was chosen to make this assessment was the independent t-test procedure comparing each of the critical thinking ability scales/sub-scales by whether or not the elementary school teachers identified mathematics as a primary content area. When these comparisons were made, no significant differences were found in the critical thinking ability scores by whether or not the elementary school teachers identified mathematics as a primary content area (see Table 17).

<b>Table 17.</b> <b>Comparison of Critical Thinking Ability of Elementary Teachers by Whether or Not They Identified Mathematics as a Primary Teaching Content Area</b>						
<u>Scale</u>	<u>N</u>	<u>df</u>	<u>M</u>	<u>SD</u>	<u>t</u>	<u>p</u>
Inference						
Not <sup>a</sup>	89 <sup>b</sup>	119	3.16	1.35	0.22	0.82
Yes	32 <sup>c</sup>		3.09	1.47		
Recognition of Assumptions			119			
Not	89		5.22	2.04	0.84	-0.21
Yes	32		5.31	2.09		
Deduction						
Not	89	119	5.79	1.67	0.71	0.37
Yes	32		5.66	1.86		
Interpretation						
Not	89	119	4.08	1.07	0.84	-0.20
Yes	32		4.12	1.28		
Evaluation of Arguments						
Not	89	119	6.66	1.453	1.31	0.19
Yes	32		6.28	1.276	1.40	
Total						
Not	89	119	24.91	4.19	0.50	0.62
Yes	32		24.47	4.54		
<sup>a</sup> Not teaching the content area (subject)						
<sup>b</sup> Number of participants in the sample who were not teaching the content area						
<sup>c</sup> Number of participants in the sample who were teaching the content area						

### Elementary Social Studies

The statistical technique that was chosen to make this assessment was the independent t-test procedure comparing each of the critical thinking ability scales/sub-scales by whether or not elementary school teachers identified social studies as a primary content area. When these

comparisons were made, no significant differences were found in the critical thinking ability scores by whether or not the elementary school teachers identified social studies as a primary content area (see Table 18).

<b>Table 18.</b>						
<b>Comparison of Critical Thinking Ability of Elementary Teachers by Whether or Not They Identified Social Studies as a Primary Teaching Content Area</b>						
<u>Scale</u>	<u>N</u>	<u>df</u>	<u>M</u>	<u>SD</u>	<u>t</u>	<u>p</u>
Inference						
Not	95 <sup>b</sup>	119	3.13	1.36	-0.22	0.83
Yes	26 <sup>c</sup>		3.19	1.44		
Recognition of Assumptions						
Not	95	119	5.17	2.01	-0.82	0.42
Yes			5.54	2.16		
Deduction						
Not	95	119	5.72	1.69	-0.44	0.66
Yes	26		5.88	1.84		
Interpretation						
Not	95	119	4.05	1.09	-0.72	0.47
Yes	26		4.23	1.21		
Evaluation of Arguments						
Not	95	119	6.60	1.45	0.56	0.57
Yes	26		6.42	1.30		
Total						
Not	95	119	24.91	4.10	-0.64	0.52
Yes	26		24.47	4.89		
<sup>a</sup> Not teaching the content area (subject)						
<sup>b</sup> Number of participants in the sample who were not teaching the content area						
<sup>c</sup> Number of participants in the sample who were teaching the content area						

### Elementary Science

The statistical technique that was chosen to make this assessment was the independent t-test procedure comparing each of the critical thinking ability scales/sub-scales by whether or not the elementary school teachers identified science as a primary content area. When these comparisons were made, no significant differences were found in the critical thinking ability scores by whether or not the elementary school teachers identified social studies as a primary content area (see Table 19).

### Elementary “Other” Areas

The next content area to be assessed was the “Other” area. The statistical technique that was chosen to make this assessment was the independent t-test procedure comparing each of the critical thinking ability scales/sub-scales by whether or not the elementary teachers identified

<b>Table 19.</b>						
<u>Comparison of Critical Thinking Ability of Elementary Teachers by Whether or Not They Identified Science as a Primary Teaching Content Area</u>						
	<u>N</u>	<u>df</u>	<u>M</u>	<u>SD</u>	<u>t</u>	<u>p</u>
Inference						
Not <sup>a</sup>	95 <sup>b</sup>	119	3.13	1.34	0.22	0.83
Yes	26 <sup>c</sup>		3.19	1.52		
Recognition of Assumptions						
Not	95	119	5.18	2.02	-0.71	0.48
Yes	26		5.50	2.16		
Deduction						
Not	95	119	5.74	1.69	-0.19	0.85
Yes	26		5.81	1.83		
Interpretation						
Not	95	119	4.07	1.08	-0.33	0.75
Evaluation of Arguments						
Not	95	119	6.65	1.43	1.35	0.18
Yes	26		6.23			
Total						
Not	95	119	24.77	4.18	-0.12	0.52
Yes	26		24.88	4.67		
<sup>a</sup> Not teaching the content area (subject)						
<sup>b</sup> Number of participants in the sample who were not teaching the content area						
<sup>c</sup> Number of participants in the sample who were teaching the content area						

“Other” as a primary content area. When these comparisons were made, only one of the Critical Thinking Ability scores (“Evaluation of Arguments”) was found to be significantly different by whether or not the teacher identified “Other” as a primary content area ( $t_{119} = 2.28$ ,  $p = .02$ ).

Elementary teachers who identified “Other” as a primary content area (mean = 7.19, SD = 1.327) had significantly higher “Evaluation of Arguments” critical thinking ability sub-scale scores than elementary teachers who did not identify “Other” as a primary content area (mean = 6.43, SD = 1.402). The “Other” category includes special education = 6, music = 1, librarians = 2, pre-K = 3, counselor = 1, lead teacher = 1, and foreign language = 1 (see Table 20).

### Middle School English-Language Arts

The next level examined was the middle school level, and the first content area in this level to be assessed was English Language Arts. The statistical technique that was chosen to make this assessment was the independent t-test procedure comparing each of the critical

<b>Table 20.</b> <b>Comparison of Critical Thinking Ability of Elementary Teachers by Whether or Not They Identified “Other” as a Primary Teaching Content Area</b>						
<u>Scale</u>	<u>N</u>	<u>df</u>	<u>M</u>	<u>SD</u>	<u>t</u>	<u>p</u>
Inference						
Not <sup>a</sup>	100 <sup>b</sup>	119	3.16	1.33	0.34	0.74
Yes	21 <sup>c</sup>		3.05	1.60		
Recognition of Assumptions						
Not	100	119	5.24	2.01	-0.09	0.93
Yes	21		5.29	2.24		
Deduction						
Not	100	119	5.73	1.64	-0.31	0.76
Yes	21		5.86	2.06		
Interpretation						
Not	100	119	4.14	1.11	1.06	0.29
Yes	21		3.86	1.11		
Evaluation of Arguments						
Not	100	119	6.43	1.40	-2.28	0.02
Yes	21		7.19	1.33		
Total						
Not	100	119	24.70	4.05	-0.52	0.60
Yes	21		25.24	5.27		
<sup>a</sup> Not teaching academic subjects such as ELA, mathematics, science, or social studies						
<sup>b</sup> Number of participants in the sample who were not teaching the content area						
<sup>c</sup> Number of participants in the sample who were teaching the content area						

thinking ability scales/sub-scales by whether or not the middle school teachers identified ELA as a primary content area. When these comparisons were made, no significant differences were found in the critical thinking ability scores by whether or not the middle school teachers identified ELA as a primary content area (see Table 21).

### Middle School Mathematics

The next content area in this level to be assessed was mathematics. The statistical technique that was chosen to make this assessment was the independent t-test procedure

comparing each of the critical thinking ability scales/sub-scales by whether or not the middle school teachers identified mathematics as a primary content area. When these comparisons were made, no significant differences were found in the critical thinking ability scores by whether or not the middle school teachers identified mathematics as a primary content area (  $n = 103$ ,  $t = -.19$ ) (see Table 22).

### Middle School Social Studies

The next content area to be assessed was the Social Studies area. The statistical technique that was chosen to make this assessment was the independent t-test procedure comparing each of the critical thinking ability scales/sub-scales by whether or not the middle school teachers identified social studies as a primary content area. When these comparisons were made, only one of the Critical Thinking Ability scores (“Interpretation”) was found to be

<b>Table 21.</b>						
<b>Comparison of Critical Thinking Ability of Middle School Teachers by Whether or Not They Identified English –Language Arts as a Primary Teaching Content Area</b>						
<u>Scale</u>	<u>N</u>	<u>df</u>	<u>M</u>	<u>SD</u>	<u>t</u>	<u>p</u>
Inference						
Not <sup>a</sup>	74 <sup>b</sup>	101	3.54	1.39	-0.44	0.66
Yes	29 <sup>c</sup>		3.69	1.93		
Recognition of Assumptions						
Not	74	101	5.39	2.13	-0.13	0.90
Yes	29		5.45	1.74		
Deduction						
Not	74	101	5.73	1.99	-1.07	0.29
Yes	29		6.17	1.58		
Interpretation						
Not	74	101	4.19	1.24	0.92	0.36
Yes	29		3.93	1.39		
Evaluation of Arguments						
Not	74	101	6.65	1.48	0.66	0.51
Yes	29		6.45	1.09		
Total						
Not	74	101	25.50	4.83	-0.19	0.85
Yes	29		25.69	5.18		
<sup>a</sup> Not teaching other subjects such as P.E., library skills, enrichment						
<sup>b</sup> Number of participants in the sample who were not teaching the content area						
<sup>c</sup> Number of participants in the sample who were teaching the content area						

significantly different by whether or not the teacher identified social studies as a primary content area ( $t_{103} = 2.26, p = .03$ ). Teachers who identified social studies as a primary content area (mean = 4.72, SD = 1.13) had significantly higher “Interpretation” critical thinking ability sub-scale scores than middle school teachers who did not identify social studies as a primary content area (mean = 3.99, SD = 1.28) (see Table 23).

<b>Table 22.</b> <u>Comparison of Critical Thinking Ability of Middle School Teachers by Whether or Not They Identified Mathematics as a Primary Teaching Content Area</u>						
<u>Scale</u>	<u>N</u>	<u>df</u>	<u>M</u>	<u>SD</u>	<u>t</u>	<u>p</u>
Inference						
Not <sup>a</sup>	79 <sup>b</sup>	101	3.63	1.63	0.60	0.55
Yes	24 <sup>c</sup>		3.42	1.28		
Recognition of Assumptions						
Not	79	101	5.32	2.04	-0.83	0.41
Yes	24		5.71	1.97		
Deduction						
Not	79	101	6.04	1.88	1.81	0.07
Yes	24		5.25	1.80		
Interpretation						
Not	79	101	4.05	1.20	-0.95	0.35
Yes	24		4.33	1.52		
Evaluation of Arguments						
Not	79	101	6.70	1.36	1.40	0.17
Yes	24		6.25	1.39		
Total						
Not	79	101	25.73	4.70	0.72	0.48
Yes	24		24.96	4.49		
<sup>a</sup> Not teaching other subjects such as P.E., library skills, enrichment						
<sup>b</sup> Number of participants in the sample who were not teaching the content area						
<sup>c</sup> Number of participants in the sample who were teaching the content area						

### Middle School Science

The next content area in this level to be assessed was science. The statistical technique that was chosen to make this assessment was the independent t-test procedure comparing each of the critical thinking ability scales/sub-scales by whether or not the middle school teachers identified science as a primary content area. When these comparisons were made, no significant



differences were found in the critical thinking ability scores by whether or not the middle school teachers identified science as a primary content area (  $n = 103$ ,  $t = -.38$ ) (see Table 24).

### Middle School Foreign Language

The next content area in this level to be assessed was foreign language. The statistical technique that was chosen to make this assessment was the independent t-test procedure comparing each of the critical thinking ability scales/sub-scales by whether or not the middle school teachers identified foreign language as a primary content area. When these comparisons were made, no significant differences were found in the critical thinking ability scores by

<b>Table 23.</b>						
<b>Comparison of Critical Thinking Ability of Middle School Teachers by Whether or Not They Identified Social Studies as a Primary Teaching Content Area</b>						
<u>Scale</u>	<u>N</u>	<u>df</u>	<u>M</u>	<u>SD</u>	<u>t</u>	<u>p</u>
Inference						
Not <sup>a</sup>	85 <sup>b</sup>	101	3.66	1.61	1.09	0.28
Yes	18 <sup>c</sup>		3.22	1.22		
Recognition of Assumptions						
Not	85	101	5.34	2.09	-0.73	0.47
Yes	18		5.72	1.71		
Deduction						
Not	85	101	5.89	1.73	0.46	0.64
Yes	18		5.67	2.54		
Interpretation						
Not	85	101	3.99	1.28	-2.26	0.03
Yes	18		4.72	1.13		
Evaluation of Arguments						
Not	85	101	6.53	1.38	-1.01	0.32
Yes	18		6.89	1.37		
Not	85	101	25.41	4.58	-0.67	0.50
Yes	18		26.22	4.98		
* Mean = 26.22						
<sup>a</sup> Not teaching other subjects such as P.E., library skills, enrichment						
<sup>b</sup> Number of participants in the sample who were not teaching the content area						
<sup>c</sup> Number of participants in the sample who were teaching the content area						

whether or not the middle school teachers identified foreign language as a primary content area ( $n = 103$ ,  $t = .13$ ) (see Table 25).

### Middle School “Other” Areas

The next content area in this level to be assessed was “Other.” The statistical technique that was chosen to make this assessment was the independent t-test procedure comparing each of the critical thinking ability scales/sub-scales by whether or not the middle school teachers identified “Other” as a primary content area. When these comparisons were made, no significant differences were found in the critical thinking ability scores by whether or not the middle school teachers identified “Other” as a primary content area ( $n = 103$ ,  $t = .29$ ) (see Table 26). “Other” consists of choral and band directors, physical education teachers, enrichment teachers, and librarians.

**Table 24.**  
Comparison of Critical Thinking Ability of Middle School Teachers by Whether or Not They Identified Science as a Primary Teaching Content

<u>Scale</u>	<u>N</u>	<u>df</u>	<u>M</u>	<u>SD</u>	<u>t</u>	<u>p</u>
Inference						
Not <sup>a</sup>	83 <sup>b</sup>	101	3.61	1.46	0.42	0.67
Yes	20 <sup>c</sup>	24.67	3.45	1.91		
Recognition of Assumptions						
Not	83	101	5.55	1.51	1.90	0.14
Yes	20	24.80	4.80	2.44		
Deduction						
Not	83	101	5.86	1.86	0.01	0.99
Yes	20	20.46	5.85	2.03		
Interpretation						
Not	83	101	4.14	1.32	0.45	0.65
Yes	20	32.83	4.00	1.12		
Evaluation of Arguments						
Not	83	101	6.47	1.86	1.40	0.07
Yes	20	33.57	7.10	1.17		
Total						
Not	83	101	25.64	4.67	-0.38	0.71
Yes	20		26.20	4.61		

<sup>a</sup>Not teaching other subjects such as P.E., library skills, enrichment

<sup>b</sup>Number of participants in the sample who were not teaching the content area

<sup>c</sup>Number of participants in the sample who were teaching the content area

### High School English-Language Arts

The next level examined was the high school level, and the first content area in this level to be assessed was English Language Arts. The statistical technique that was chosen to make

this assessment was the independent t-test procedure comparing each of the critical thinking ability scales/sub-scales by whether or not the high school teachers identified ELA as a primary content area. When these comparisons were made, no significant differences were found in the critical thinking ability scores by whether or not the high school teachers identified ELA as a primary content area (  $n = 102$ ,  $t = .13$ ) (see Table 27).

<b>Table 25.</b> <u>Comparison of Critical Thinking Ability of Middle School Teachers by Whether or Not They Identified “Foreign Language” as a Primary Teaching Content Area</u>						
<u>Sub-Scale</u>	<u>N</u>	<u>df</u>	<u>M</u>	<u>SD</u>	<u>t</u>	<u>p</u>
Inference						
Not <sup>a</sup>	99 <sup>b</sup>	101	3.63	1.55	1.43	0.16
Yes	04 <sup>c</sup>		2.50	1.29		
Recognition of Assumptions						
Not	99	101	5.39	2.01	-0.34	0.73
Yes	04		5.75	2.63		
Deduction						
Not	99	101	5.91	1.89	1.47	0.14
Yes	04		4.50	1.29		
Interpretation						
Not	99	101	4.08	1.24	-1.42	0.16
Yes	04		5.00	2.16		
Evaluation of Arguments						
Not	99	101	6.56	1.39	-1.35	0.18
Yes	04		7.50	.58		
Total						
Not	99	101	25.57	4.63	0.13	
Yes	04		25.25	5.44		
<sup>a</sup> Not teaching other subjects such as P.E., library skills, enrichment						
<sup>b</sup> Number of participants in the sample who were not teaching the content area						
<sup>c</sup> Number of participants in the sample who were teaching the content area						

### High School Mathematics

The next content area to be assessed was the Mathematics area. The statistical technique that was chosen to make this assessment was the independent t-test procedure comparing each of the critical thinking ability scales/sub-scales by whether or not the high school teachers identified mathematics as a primary content area. When these comparisons were made, three of the Critical Thinking Ability sub-scores (“Deduction,” “Interpretation,” and “Overall Scores”) were

found to be significantly different by whether or not the teacher identified mathematics as a primary content area. Teachers who identified mathematics as a primary content area had significantly higher “Deduction” ( $t_{103} = -2.84$ ,  $p = .006$ ), “Interpretation” ( $t_{103} = -2.22$ ,  $p = .03$ ),

<b>Table 26.</b>						
<u>Comparison of Critical Thinking Ability of Middle School Teachers by Whether or Not They Identified “Other” as a Primary Teaching Content Area</u>						
<u>Scale</u>	<u>N</u>	<u>df</u>	<u>M</u>	<u>SD</u>	<u>t</u>	<u>p</u>
Not <sup>a</sup>	89 <sup>b</sup>	101	3.56	1.58	-0.34	0.73
Yes	14 <sup>c</sup>		3.71	1.38		
Recognition of Assumptions						
Not	89	101	5.40	1.99	-0.04	0.97
Yes	14		5.43	2.31		
Deduction						
Not	89	101	5.85	1.91	-0.01	0.99
Yes	14		5.86	1.79		
Interpretation						
Not	89	101	4.17	1.33	1.04	0.30
Yes	14		3.79	.80		
Evaluation of Arguments						
Not	89	101	6.62	1.28	0.48	0.63
Yes	14		6.43	1.91		
Total						
Not	89	101	25.61	4.58	0.29	0.77
Yes	14		25.21	5.19		
<sup>a</sup> Not teaching other subjects such as P.E., library skills, enrichment						
<sup>b</sup> Number of participants in the sample who were not teaching the content area						
<sup>c</sup> Number of participants in the sample who were teaching the content area						

and Overall Scales ( $t_{103} = -2.20$ ,  $p = .03$ ) critical thinking ability sub-scale scores than high school teachers who did not identify mathematics as a primary content area (see Table 30). In the Deduction sub-scale, the teachers who identified Mathematics as a primary content area had a mean of 7.23 (SD = 1.363) compared to teachers who did not identify Mathematics as a primary content area who had a mean of 5.98 (SD = 1.502). On the “Interpretation” sub-scale, teachers who identified Mathematics as a primary content area had a mean of 5.00 (SD = 1.291) compared to teachers who did not identify Mathematics as a primary content area who had a mean of 4.17 (SD = 1.250). In addition to the significant sub-scales, teachers who identified

Mathematics as a primary content area also had a significantly higher Overall Critical Thinking Ability score (mean = 28.38, SD = 5.237) than teachers who did not identify Mathematics as a primary content area (mean = 25.31, SD = 4.626) ( $t_{103} = -2.22$ ,  $p = .03$ ) (see Table 28).

**Table 27.**  
Comparison of Critical Thinking Ability of High School Teachers by Whether or Not They Identified English Language Arts as a Primary Teaching Content Area

Scale	<u>N</u>	<u>df</u>	<u>M</u>	<u>SD</u>	<u>t</u>	<u>p</u>
Inference						
Not <sup>a</sup>	84 <sup>b</sup>	98	3.37	1.53	0.13	0.90
Yes	16 <sup>c</sup>	18.92	3.31	1.89		
Recognition of Assumptions						
Not	84	98	5.64	1.89	0.40	0.69
Yes	16	22.18	5.44	1.75		
Deduction						
Not	84	98	6.04	1.59	-1.57	0.12
Yes	16	29.18	6.69	1.08		
Interpretation						
Not	84	98	4.35	1.33	1.17	0.25
Yes	16	28.25	3.94	.93		
Evaluation of Arguments						
Not	84	98	6.35	1.45	0.38	0.70
Yes	16	18.91	6.19	1.80		
Total						
Not	84	98	25.74	4.82	0.13	0.89
Yes	16	21.04	25.56	4.84		

<sup>a</sup>Not teaching other subjects such as P.E., library skills, enrichment

<sup>b</sup>Number of participants in the sample who were not teaching the content area

<sup>c</sup>Number of participants in the sample who were teaching the content area

### High School Social Studies

Another content area in this level to be assessed was social studies. The statistical technique that was chosen to make this assessment was the independent t-test procedure comparing each of the critical thinking ability scales/sub-scales by whether or not the high school teachers identified social studies as a primary content area. When these comparisons were made, no significant differences were found in the critical thinking ability scores by whether or not the high school teachers identified social studies as a primary content area (see Table 29).

<b>Table 28.</b> <b>Comparison of Critical Thinking Ability of High School Teachers by Whether or Not They Identified Mathematics as a Primary Teaching Content Area</b>						
<u>Scale</u>	<u>N</u>	<u>df</u>	<u>M</u>	<u>SD</u>	<u>t</u>	<u>p</u>
Inference						
Not <sup>a</sup>	87 <sup>b</sup>	98	3.32	1.55	-0.62	0.54
Yes	13 <sup>c</sup>		3.62	1.81		
Recognition of Assumptions						
Not	87	98	5.52	1.79	-1.30	0.20
Yes	13		6.23	2.24		
Deduction						
Not	87	98	5.98	1.50	-2.84	0.01
Yes	13		7.23	1.36		
Interpretation						
Not	87	98	4.17	1.25	-2.22	0.03
Yes	13		5.00	1.29		
Evaluation of Arguments						
Not	87	98	6.32	1.40	0.03	0.98
Yes	13		6.31	2.14		
Total						
Not	87	98	25.31	4.63	-2.20	0.03
Yes	13	14.93	28.38	5.24		
<sup>a</sup> Not teaching other subjects such as P.E., library skills, enrichment						
<sup>b</sup> Number of participants in the sample who were not teaching the content area						
<sup>c</sup> Number of participants in the sample who were teaching the content area						

### High School Science

Another content area in this level to be assessed was science. The statistical technique that was chosen to make this assessment was the independent t-test procedure comparing each of the critical thinking ability scales/sub-scales by whether or not the high school teachers identified science as a primary content area. When these comparisons were made, no significant differences were found in the critical thinking ability scores by whether or not the high school teachers identified science as a primary content area (  $n = 100$ ,  $t = -.15$ ) (see Table 30).

### High School Art

Another content area in this level to be assessed was art. The statistical technique that was chosen to make this assessment was the independent t-test procedure comparing each of the critical thinking ability scales/sub-scales by whether or not the high school teachers identified art

as a primary content area. When these comparisons were made, no significant differences were found in the critical thinking ability scores by whether or not the high school teachers identified art as a primary content area (see Table 31).

**Table 29.**  
Comparison of Critical Thinking Ability of High School Teachers by Whether or Not They Identified Social Studies as a Primary Teaching Content Area

<u>Scale</u>	<u>N</u>	<u>df</u>	<u>M</u>	<u>SD</u>	<u>t</u>	<u>p</u>
Not <sup>a</sup>	83 <sup>b</sup>	98	3.31	1.57	-0.65	0.52
Yes	17 <sup>c</sup>	1.66	3.59	1.66		
Recognition of Assumptions						
Not	83	98	5.58	1.86	-0.38	0.71
Yes	17	22.54	5.76	1.92		
Deduction						
Not	83	98	6.24	1.48	1.46	0.15
Yes	17	20.84	5.65	1.77		
Interpretation						
Not	83	98	4.23	1.27	-0.88	0.38
Yes	17	22.42	4.53	1.33		
Evaluation of Arguments						
Not	83	98	6.31	1.55	-0.10	0.92
Yes	17	25.85	6.35	1.32		
Not	83	98	25.67	4.58	-0.16	0.87
Yes	17	20.14	25.88	5.89		

<sup>a</sup>Not teaching other subjects such as P.E., library skills, enrichment

<sup>b</sup>Number of participants in the sample who were not teaching the content area

<sup>c</sup>Number of participants in the sample who were teaching the content area

### High School Foreign Language

Another content area in this level to be assessed was foreign language. However, since there were only two teachers who identified “Foreign Language” as a primary content area, no statistical comparisons were made. The means and standard deviations are presented in Table 33 for descriptive purposes, but two subjects do not provide adequate data to make meaningful statistical comparisons (see Table 32).

### High School Career Technical Education (CTE)

Career Technical Education (CTE) was the last content area in high school to be assessed and described. The statistical technique that was chosen to make this assessment was the

independent t-test

procedure comparing each of the critical thinking ability scales/sub-scales by whether or not the high school teachers identified Career Technical Education as a primary content area. When these comparisons were made, one of the Critical Thinking Ability scores (“Interpretation”) was found to be significantly different by whether or not the teacher identified Career Technical Education as a primary content area ( $t_{98} = 2.04$ ,  $p = .04$ ). Teachers who identified Career Technical Education (mean = 3.64, SD = 1.39) as a primary content area had significantly lower “Interpretation” critical thinking ability sub-scale scores than high school teachers who did not identify Career Technical Education as a primary content area ( $M = 4.38$ ,  $SD = 1.24$ ) (see Table 33).

<b>Table 30.</b>						
<u>Comparison of Critical Thinking Ability of High School Teachers by Whether or Not They Identified Science as a Primary Teaching Content Area</u>						
<u>Scale</u>	<u>N</u>	<u>df</u>	<u>M</u>	<u>SD</u>	<u>t</u>	<u>p</u>
Inference						
Not <sup>a</sup>	89 <sup>b</sup>	98	3.35	1.60	-0.21	0.84
Yes	11 <sup>c</sup>	12.94	3.45	1.51		
Recognition of Assumptions						
Not	89	98	5.58	1.87	-0.39	0.70
Yes	11	12.71	5.82	1.83		
Deduction						
Not	89	98	6.18	1.59	0.73	0.47
Yes	11	15.92	5.82	1.08		
Interpretation						
Not	89	98	4.28	1.31	0.02	0.98
Yes	11	13.71	4.27	1.10		
Evaluation of Arguments						
Not	89	98	6.29	1.55	-0.53	0.60
Yes	11	15.09	6.55	1.13		
Total						
Not	89	98	25.69	4.91	-0.15	0.89
Yes	11	14.04	25.91	3.99		
<sup>a</sup> Not teaching other subjects such as P.E., library skills, enrichment						
<sup>b</sup> Number of participants in the sample who were not teaching the content area						
<sup>c</sup> Number of participants in the sample who were teaching the content area						



<b>Table 31.</b> <b>Comparison of Critical Thinking Ability of High School Teachers by Whether or Not They Identified Art as a Primary Teaching Content Area</b>						
<u>Scale</u>	<u>N</u>	<u>df</u>	<u>M</u>	<u>SD</u>	<u>t</u>	<u>p</u>
Inference						
Not <sup>a</sup>	93 <sup>b</sup>	98	3.37	1.63	0.13	0.90
Yes	07 <sup>c</sup>	10.83	3.29	.76		
Recognition of Assumptions						
Not	93	98	5.59	1.86	-0.36	0.72
Yes	07	6.77	5.86	2.04		
Deduction						
Not	93	98	6.06	1.52	-1.81	0.07
Yes	07	6.87	7.14	1.57		
Interpretation						
Not	93	98	4.24	1.27	-1.24	0.22
Yes	07	7.38	4.86	1.07		
Evaluation of Arguments						
Not	93	98	6.27	1.51	-1.24	0.22
Yes	07	7.30	7.00	1.30		
Total						
Not	93	98	25.53	4.77	-1.40	0.17
Yes	07	6.89	28.14	4.88		
<sup>a</sup> Not teaching other subjects such as P.E., library skills, enrichment						
<sup>b</sup> Number of participants in the sample who were not teaching the content area						
<sup>c</sup> Number of participants in the sample who were teaching the content area						

### Objective Four

Objective Four was to compare the critical thinking abilities of public school teachers in a parish in Southwest Louisiana (as measured by the Watson-Glaser Critical Thinking Appraisal Short Form Test) by the level of their current primary teaching assignment (defined as elementary, middle, or secondary). In order to accomplish this objective, the researcher used the one-way analysis of variance procedure with each of the critical thinking ability scores/sub-scale scores compared by categories of the variable level of teaching assignment. When these comparisons were made, no significant F values were found indicating that there were no differences in the critical thinking abilities of teachers by their primary level taught (see Table 34).

**Table 32.**

**Comparison of Critical Thinking Ability of High School Teachers by Whether or Not They Identified Foreign Language as a Primary Teaching Content Area**

<u>Scale</u>	<u>N</u>	<u>M</u>	<u>SD</u>	<u>t</u>	<u>p</u>
Inference					
Not <sup>a</sup>	98 <sup>b</sup>	3.38	1.58	0.78	0.44
Yes	02 <sup>c</sup>	2.50	2.12		
Recognition of Assumptions					
Not	98	5.60	1.87	-0.30	0.76
Yes	02	6.00	1.41		
Deduction					
Not	98	6.14	1.55	0.13	0.90
Yes	02	6.00	1.41		
Interpretation					
Not	98	4.33	1.22	2.61	0.01
Yes	02	2.00	2.83		
Evaluation of Arguments					
Not	98	6.33	1.52	0.30	0.76
Yes	02	6.00	.00		
Total					
Not	98	25.78	4.82	3.28	0.34
Yes	02	22.50	.71		

<sup>a</sup>Not teaching other subjects such as P.E., library skills, enrichment

<sup>b</sup>Number of participants in the sample who were not teaching the content area

<sup>c</sup>Number of participants in the sample who were teaching the content area

### Objective Five

Objective five was to determine if a model existed which explained a significant portion of the variance among public school teachers in a parish in Southwest Louisiana as measured by the Watson-Glaser Critical Thinking Skills Short Form Test, from the following variables: gender, race, age, highest level of education completed, years of teaching experience, and subjects (areas of content) taught.

To accomplish this objective, the researcher used a multiple regression analysis with the independent variables entered into the analysis using the forward entry technique in the study. In conducting the regression analysis, four of the measures to be treated as independent variables were categorical in nature and therefore had to be prepared as dichotomous variables in

preparation for entry into the analysis. These variables included race, highest level of education completed, primary content area taught, and grade level taught.

<b>Table 33.</b> <u>Comparison of Critical Thinking Ability of High School Teachers by Whether or Not They Identified CTE Areas as a Primary Teaching Content Area</u>						
<u>Scale</u>	<u>N</u>	<u>df</u>	<u>M</u>	<u>sd</u>	<u>t</u>	<u>p</u>
Inference						
Not <sup>a</sup>	86 <sup>b</sup>	98	3.38	1.59	0.37	0.71
Yes	14 <sup>c</sup>		3.21	1.58		
Recognition of Assumptions						
Not	86	98	5.64	1.89	0.39	0.70
Yes	14		5.43	1.70		
Deduction						
Not	86	98	6.20	1.56	0.93	0.36
Yes	14		5.79	1.42		
Interpretation						
Not	86	98	4.38	1.24	2.04	0.04
Yes	14		3.64	1.39		
Evaluation of Arguments						
Not	86	98	6.37	1.53	0.86	0.39
Yes	14		6.00	1.30		
Total						
Not	86	98	25.98	4.90	1.39	0.17
Yes	14		24.07	3.85		
<sup>a</sup> Not teaching other subjects such as P.E., library skills, enrichment <sup>b</sup> Number of participants in the sample who were not teaching the content area <sup>c</sup> Number of participants in the sample who were teaching the content area						

<b>Table 34.</b> <u>Comparison of Critical Thinking Abilities by Level of Primary Teaching Assignment of Public School Teachers in a Parish in Southwest Louisiana</u>			
Critical Thinking			
<u>Sub-Scale</u>	<u>df</u>	<u>F</u>	<u>Sig.</u>
Inference	2, 321	2.399	0.09
Deduction	2, 321	1.593	0.21
Evaluation of Arguments	2, 321	1.114	0.33
Recognition of Assumptions	2, 321	0.973	0.38
Interpretation	2, 321	0.791	0.45
Total Scales	2, 321	1.364	0.26

The first of these variables was “Race” of the study participant. The nature of this data was such that two of the four racial groups that were represented in the study had frequencies that were not adequate to use them as separate variables of investigation. The American Indian

( $n = 2$ ) and Hispanic ( $n = 3$ ) categories could not be treated as separate independent variables with these frequencies. Each of the remaining racial categories was coded as a binary variable with each subject classified as either possessing or not possessing that trait. Therefore, all individuals were coded as either possessing the trait of being African-American (coded as “1”) or not possessing the trait of being African-American (coded as “0”) and either possessing the trait of being Caucasian (coded as “1”) or not possessing the trait of being Caucasian (coded as “0”).

Another variable that was recoded for use in the regression analysis was the “Grade Level taught.” This variable consisted of three levels, elementary, middle, or high school. Each of these three levels was established as a separate variable for use in the regression analysis such that all study participants either possessed the characteristic of being a teacher at the Elementary School level (coded as “1”) or did not possess the characteristic of being a teacher at the Elementary School level (coded as “0”). Additionally, study participants were coded on another variable that they either possessed the characteristic of being a teacher at the Middle School level (coded as “1”) or did not possess the characteristic of being a teacher at the Middle School level (coded as “0”); and they were coded that they either possessed the characteristic of being a teacher at the High School level (coded as “1”) or did not possess the characteristic of being a teacher at the High School level (coded as “0”).

For the variable Educational Level, all participants identified themselves as having bachelor’s, master’s, master’s plus 30 certification or specialist degrees. None of the other educational levels that were available in the instrument received any responses from the respondents. These levels with no responses included: GED’s, high school graduates, some college, doctorates, and other. Additionally, the number of individuals who identified “Specialist” as their highest level of education completed ( $n = 3$ ) was insufficient to establish that category as a separate independent variable in the regression analysis. Therefore, three

levels of the variable “Highest level of education completed” were coded as dichotomous variables for inclusion in the regression analysis. These recoded variables included “Bachelors Degree” with those indicating that this was their highest level of education completed coded as “1” and those who did not indicate that this was their highest level of education completed coded as “0.” This process was also used for the levels “Masters Degree” and “Masters Degree Plus 30 Hours.”

While differences exist in the content areas taught at the three levels of instruction (elementary, middle, and high school), the four core course content areas are present in some form in all grade levels throughout the student’s education career. Therefore, the researcher established a dichotomous variable for each of these four primary content areas (English Language Arts/Reading, Mathematics, Social Studies, and Science) to be included in the regression analysis. Therefore, each of the study participants was coded as either having identified English Language Arts/Reading as a primary content area (coded as “1”) or not having identified English Language Arts/Reading as a primary content area (coded as “0”). This same procedure was followed for the primary content areas of Mathematics, Social Studies, and Science. Other content areas that were specific to the grade level taught or had inadequate numbers for inclusion in the regression analysis as a separate independent variable were not included in this analysis.

Gender was also a categorical variable that was used in the regression analysis. However, since gender is a natural dichotomy, it did not have to be recoded for use in the analysis. For the variable gender, male was coded “1” and female was coded “2.”

Step one of the analysis included the researcher’s examination of the data for the presence of excessive multicollinearity among the independent variables in the analysis. This was accomplished through examination of the tolerance values and the variance inflation factor

(VIF) for the data included in the analysis. The tolerance values ranged from .20 to 1.00 and the VIF values ranged from 1.00 to 5.026 (see Table 35). According to Hair, Black, Babin, Anderson, and Tatham (2006) typical, a measure that is used to identify excess levels of multicollinearity is a tolerance value of .10 (which corresponds to a VIF of 10.0). Since the tolerance values and the VIF values were within acceptable ranges, the researcher concluded that no instance of excessive collinearity among the independent variables was evident in the data. Thus the researcher proceeded with the regression analysis.

**Table 35.**  
Collinearity Diagnostic Measures for the Regression of Critical Thinking Abilities on Selected Demographics Among Public School Teachers in a Parish in Southwest Louisiana

<u>Factor</u>	<u>Tolerance</u>	<u>VIF</u>
Gender	1.000	1.000
Social Studies Content Taught	1.000	1.000
English Language Arts Content Taught	1.000	1.000
Science Content Taught	1.000	1.000
Years of Experience	1.000	1.000
Master's Plus 30 Degree	1.000	1.000
African-American	1.000	1.000
Elementary	0.999	1.001
Math Content Taught	0.998	1.002
Age	0.994	1.006
Bachelor's Degree	0.997	1.003
Middle School	0.974	1.026
High School	0.966	1.035
Caucasian	0.20	5.026

The next step in conducting the regression analysis was to examine the bivariate relationships between the dependent variable (Total Critical Thinking Ability Score) and each of the potential predictor variables that are included in the analysis. For descriptive purposes, two-

way correlations between factors used as independent variables in the regression analysis and the dependent variable are presented in Table 36. African-American ( $r = -.21$ ), Caucasian ( $r = .19$ ) was the only variable that was found to be statistically significant among the different variables.

<b>Table 36.</b> <u>Relationship Between Selected Predictor Variables and Critical Thinking Ability of Public School Teachers in a Parish in Southwest Louisiana</u>		
<u>Variable</u>	<u><math>r</math></u>	<u><math>p^a</math></u>
Gender	-0.07	0.10
Age	0.07	0.11
Math Content Taught	0.02	0.36
Social Studies Content Taught	0.057	0.20
English Language Arts	-0.04	0.22
Science Content Taught	-0.01	0.43
Years of Experience	0.06	0.15
Caucasian	0.19	<0.001
Bachelor's Degree	-0.08	0.09
Master's Degree	0.06	0.15
Master's Plus 30 Degree	0.03	0.27
African-American	-0.21	<0.001
Elementary Level	-0.08	0.08
Middle Level	0.04	0.27
High School Level	0.05	0.19

Note: N=313; <sup>a</sup> One-tailed significance

When the regression analysis was examined, one variable entered the regression model explaining a significant portion of the variance in critical thinking abilities of public teachers in a parish in southwest Louisiana. This variable was whether or not teachers have the trait of being members of the African-American race. This variable explained 4.3% ( $F_{\text{change}} = 13.970$ ,  $p = <.001$ ) of the variance in critical thinking abilities of public school teachers in a parish in Southwest Louisiana (see Table 38). The nature of the influence of this variable was such that

teachers who were African American tended to have lower critical thinking ability scores than those who were not African American. Results of the regression analysis are presented in Table 37.

<b>Table 37.</b> Multiple Regression Analysis of Critical Thinking Skills on Selected Demographic Variables of Public School Teachers in a Parish in Southwest Louisiana				
<u>Source of Variation</u>	<u>df</u>	<u>MS</u>	<u>F-ratio</u>	<u>P</u>
Regression	1	280.441	13.970	<0.001
Residual	311	20.074		
Total	312			

<b>Table 38.</b> Model Summary					
<u>Model</u>	<u>R<sup>2</sup></u> <u>Cumulative</u>	<u>R<sup>2</sup></u> <u>Change</u>	<u>F</u> <u>Change</u>	<u>Standardized</u> <u>Sig.F</u> <u>Change</u>	<u>Coefficients</u> <u>Beta</u>
African-American	0.043	0.043	13.970	<0.001	-0.207

Fourteen variables were not included in the equation. These variables are shown in Table 39.

<b>Table 39.</b> Variables not in the Equation		
<u>Variables</u>	<u>t</u>	<u>Sig.t</u>
Education, Bachelor's	-1.554	0.124
Age	1.522	0.129
Gender	-1.313	0.190
Education, Master's	1.278	0.202
Years of Experience	1.019	0.309
Social Studies Content	0.848	0.397
ELA Content	-0.825	0.410
Education Master's Plus 30	0.624	0.533
Math Content	0.503	0.615
Science Content	-0.253	0.801
Caucasian	0.093	0.842
Elementary School Level	-1.371	0.172
Middle School Level	1.245	0.214
High School Level	0.200	0.842



## **CHAPTER FIVE: SUMMARY, CONCLUSIONS, RECOMMENDATIONS:**

### **Purpose**

This study included a research design using a descriptive survey questionnaire. The purpose of this study was to determine the influence of selected demographic characteristics on the higher order critical thinking skills of public school teachers in a parish in Southwest Louisiana. The dependent variable of this study was the critical thinking skills of public school teachers in a parish in Southwest Louisiana.

### **Specific Objectives**

The specific research objectives were:

1. To describe currently employed public school teachers in a parish in Southwest Louisiana on the following selected personal and professional demographic characteristics:
  - a. Gender,
  - b. Race,
  - c. Age,
  - d. Highest level of education completed,
  - e. Grade level (defined as elementary, middle, or high school),
  - f. Subject(s) taught, and
  - g. Years of teaching experience.
2. To describe public school teachers in a parish in Southwest Louisiana on their critical thinking abilities as measured by the Watson-Glaser Critical Thinking Appraisal Short Form.
3. To determine if a relationship exists between the critical thinking abilities (as measured by the Watson-Glaser Thinking Appraisal Short Form) of public school teachers in a

parish in Southwest Louisiana and the following personal and professional demographic characteristics:

- a. Gender,
  - b. Race,
  - c. Age,
  - d. Highest level of education completed,
  - e. Grade level (elementary, middle, or high school),
  - f. Years of teaching experience, and
  - g. Subject(s) taught.
4. To compare the critical thinking abilities (as measured by the Watson-Glaser Critical Thinking Appraisal Short Form) of public school teachers in a parish in Southwest Louisiana by the level of their current primary teaching assignment (defined as elementary, middle, or secondary).
5. To determine if a model exists explaining a significant portion of the variance in critical thinking abilities (as measured by the Watson-Glaser Critical Thinking Appraisal Short Form) of public school teachers in a parish in Southwest Louisiana from the following personal and professional demographic characteristics:
  - a. Gender,
  - b. Race,
  - c. Age,
  - d. Highest level of education completed,
  - e. Grade level(s) taught (defined as elementary, middle, or high school),
  - f. Years of teaching experience.

## Methodology

The accessible population was defined as public school teachers in a parish in Southwest Louisiana who were teaching in 2008-2009. Three strata of public school teachers were selected for use in this study, representing three levels of content areas and grades: elementary (k-5 grades), middle (6-8 grades), and high school (9-12 grades). A minimum number of responses for the sample was determined to be 157 using Cochran's sample size determination formula.

The minimum number of useable responses was attained from the schools randomly selected. One additional school was to be randomly selected from each school level until the minimum number of responses could be reached. Six elementary schools, three middle schools, and two high schools were initially drawn. Among the elementary schools, the researcher emailed notices and called principals about the questionnaires (demographic instruments) and the *Watson-Glaser Critical Thinking Appraisal Short Form Test*. Principals were given choices of time of day and grouping by the researcher. They were asked by the researcher to choose specific time periods, whether during the school day when the researcher would meet with whole faculty study groups or after school to meet with the entire faculty. Five elementary schools, four middle schools, and three high schools scheduled testing with the researcher either during the school days or immediately after school. When one elementary school did not respond, the researcher drew from the pool to replace the elementary school and a decision was made to add a high school in the sample. The researcher drew the additional high school. From this action, there were five elementary schools, four middle schools, and three high schools that participated in the study. Twelve total public schools in a parish in Southwest Louisiana were chosen as the sample population to administer the tests and questionnaires.

The researcher compiled all of the data both at her home site and at LSU. The researcher ran instruments according to the objectives of the study. Printouts were made and the researcher then began the process of analyzing the data.

### **Instrumentation**

The instrument used in this study consisted of two parts. The first part of the instrument consisted of the Watson-Glaser Critical Thinking Skills Short Form Test which was used to measure respondents' Overall Critical Thinking Skills and the five sub-scales on the test: Inference, Recognition of Assumptions, Deduction, Interpretation, and Evaluation of Arguments. The second part of the instrument consisted of a researcher designed questionnaire survey, which included questions regarding demographic information. Both the Critical Thinking Skills Short Form Test and the Demographic Instrument were administered within a thirty-five minute time frame.

Permission for this study was requested and granted from the Calcasieu Parish School System Research Office. The researcher also received permission from the IRB Office for conducting the study. Such a request was approved from the Institutional Review Board (IRB).

### **Data Collection**

After obtaining informed consent from the parish superintendent of schools and principals from whom the sample had been drawn, the tests and demographic questionnaires were administered.

The researcher collected data during the on-site testing. Each test instrument was matched with the paired demographic questionnaire. The cover letter consisted of a notice explaining the methodology of the study, including the testing process and administration of the demographic instrument. The purpose and expectations of study participation were explained, along with verification of school and other criteria. At the scheduled time, the researcher arrived

on campus to administer the tests and demographic questionnaires. The researcher presented each participant who returned study instruments with a twelve-ounce chocolate bar and a certificate for CEU's (continuous education units) when the participants handed in pencils, Watson-Glaser Critical Thinking Answer Documents, and the demographic instruments. As the forms and pencils were being handed in, the researcher checked each form to make certain matching numbered tests and questionnaires were being turned in. (Only one participant did not accept the chocolate bar and one person asked for two candy bars.) There was not a need for non-response follow-up procedures for the sample due to the 324 persons who participated in the study. A minimum of 157 was met in the twelve schools sampling. Among the 326 who were asked to participate, only two who had prior commitments left without completing the testing and questionnaires (99.39% completed and turned in documents). Therefore, 324 returned materials to the researcher.

## **Objectives**

### **Objective One**

The first objective of the study was to describe currently employed public school teachers in a parish in Southwest Louisiana on the following selected personal and professional demographic characteristics:

- a. Gender,
- b. Race,
- c. Age,
- d. Highest level of education completed,
- e. Grade level (defined as elementary, middle, or high school),
- f. Years of teaching experience, and
- g. Subject(s) taught.

It was determined that the public school teachers in a parish in Southwest Louisiana had a predominantly female population ( $n = 272$ , 84.2%) and the male population in the sample was 51 or 15.8%. One person refused to identify gender. The majority of the participants were Caucasian ( $n = 286$ , 88.5%). The remaining teachers who were reported on were African-American ( $n = 32$ , 9.9%). Three participants reported themselves as being Hispanic and two reported themselves as being American Indian. One person did not identify his or her race. In the independent variable concerning age, the public school teachers ranged in age from 22 to 71 years of age, with a mean age of 40.15 and a standard deviation of 11.514. Nine persons did not report their ages. For the purposes of reporting, the researcher put ages into categories and found that 55.6% ( $n = 175$ ) were forty years of age or less than forty years of age. Only 22.8 % of public school teachers were above the age of 51 ( $n = 72$ ).

Educational levels as reported by the participants were mixed with the largest group having completed a bachelor's degree ( $n = 216$ , 67.1%) and the second largest group having completed a master's degree ( $n = 71$ , 22.1%). Two of the participants in the study did not identify the highest degrees they had earned. The grade levels that the teachers taught were defined as elementary, middle, and high school. Of the 324 teachers who participated in the study, the level at which the largest group responded was the group that taught in elementary or grades k-5 ( $n = 122$ , 37.7%). The second largest group was middle school ( $n = 102$ , 31.5%). The high school group consisted of 100 or 30.9%. For years of teaching experience, the researcher grouped the participants into ten-year group with the exception of the first group of teachers, which showed 0-3 years of experience. The mean of the years of experience was 12.14 with a standard deviation of 9.47. The highest percentages of teachers were taught in the 3 to 9 years category ( $n = 112$ , 34.6%). The second highest group was the 10-19 years of experience category with 94 respondents identifying themselves to be in this category (29.0%). In the

subjects or areas of content taught, the data were summarized separately for each of the three levels of teaching: elementary, middle, and high school. Elementary teachers were asked to provide information as to whether they taught English-language Arts (reading), mathematics, social studies, science, or other as a primary subject. Elementary public school teachers in this study identified English-Language Arts (reading) as the subject most taught ( $n = 81$ , 66.9%). In middle school, the largest group of teachers identified ELA again as the subject most taught ( $n = 29$ , 28.2%). In the high school category, the largest group of teachers identified social studies as their primary teaching area ( $n = 17$ , 5.2%).

### Objective Two

The second objective was to describe public school teachers in a parish in Southwest Louisiana on their critical thinking abilities as measured by the *Watson-Glaser Critical Thinking Appraisal Short Form*. The *Watson-Glaser Critical Thinking Appraisal Short Form Test* was broken down into five separate categories: Inference, Recognition of Assumptions, Deduction, Interpretation, and Evaluation of Arguments. To summarize the information, the mean scores for each of the sub-scales and the overall critical thinking ability scale were computed. The Evaluation of Arguments sub-scale had the highest score ( $M = 6.50$ ,  $SD = 1.503$ ). Seventy-two percent of the category Evaluation of Arguments was correct. Since each of the five sub-scales had varying numbers of items, an examination of the mean sub-scale scores gave a more meaningful picture if they were converted to a common scale. The Evaluation of Arguments had the highest score and Inference category remained at the bottom with 47.9% correct. A frequency table was set up for the purposes of this study. Testing for the sample indicated that 54% of the study participants were in the lowest group with 1-25 correct items on the test. (see Chapter 4, Table 9). The researcher further divided the scores into the five divisions of the test: Inference, Recognition of Assumptions, Deduction, Interpretation, and Evaluation of Arguments. The

means ranged from 3.35 in the five-item inference section to 6.50 in the nine-item Evaluation of Arguments (see Chapter 4, Table 17).

### Objective Three

Objective Three was to determine if a relationship exists between the critical thinking abilities (as measured by the Watson-Glaser Thinking Appraisal Short Form) of public school teachers in a parish in Southwest Louisiana and the following personal and professional demographic characteristics:

- a. Gender,
- b. Race,
- c. Age,
- d. Highest level of education completed,
- e. Years of teaching experience, and
- f. Subject(s) (areas of content) taught.

The first variable examined for a relationship with critical thinking ability as measured by the sub-scales of the Watson-Glaser Critical Thinking Appraisal Short Form Test was the variable gender. On one scale, the Interpretation sub-scale, the nature of the difference between the comparison groups was such that male teachers ( $M = 4.69$ ,  $SD = 1.21$ ) had significantly higher critical thinking ability scores than did the females ( $M = 4.06$ ,  $SD = 1.20$ ). None of the other critical thinking ability sub-scale scores, including the overall score, was found to be significantly different by gender of participant.

Another variable Race was examined. For this measure, the independent measures t-test was used to measure the differences in the two groups. A significant difference was found in four of the five sub-scales and the overall scale. The four sub-scales, which showed significance,



were: Inference, Deduction, Recognition of Assumptions, and Interpretation plus the Overall Scale. One sub-scale was not found to be significantly different: Evaluation of Arguments.

Another variable used in this objective was Age. A Pearson's Product Coefficient Correlation was used. Significance in the scale of Recognition of Assumptions was found. A positive correlation ( $r = +.199$ ) with age shows that the two variables move in the same direction in this scale (Recognition of Assumptions). This correlation between age and the dependent variable critical thinking skills is not indicated in the other four scales of Inference, Deduction, Interpretation, and Evaluation of Arguments.

Another variable examined in this objective was the highest level of education completed. A Spearman's Rank Order Correlation was used to determine the associations. Analysis of study findings showed that there was not significance among the levels of education of the participants as to the variables listed in the category highest level of education. Most of the participants had bachelor's degrees ( $n = 216$ ).

Another variable, which was examined for its relationship with the Critical Thinking Ability scores among public school teachers in a parish in Southwest Louisiana, was the instructional content areas they identified as one of their primary content areas. Elementary teachers who identified ELA as a primary content area (mean = 6.36,  $p = .02$ ) had significantly lower sub-scale scores in Evaluation of Arguments ( $M = 6.98$ ,  $SD = 1.271$ ). Each of the content areas was examined for variability or patterns. The content area showed significance in ELA: an inverse relationship in ELA versus non-reading teachers. The teachers who did not teach reading were significantly higher than those teachers who did teach reading.

Significance was not found in the elementary areas of mathematics, social studies, and science. In the elementary area of Other subjects taught, the sub-scale Evaluation of Arguments had higher scores than other scales ( $t = -2.28$ ,  $p = .02$ ).

For the middle grades, no significance was shown in English-language Arts, mathematics, science, foreign languages (not enough data), and other. In social studies areas being taught, in the sub-scale of Interpretation, there were much higher scores among teachers of social studies.

In high school, no significance was shown in ELA, social studies, science, art, and foreign language (not enough data). However, in the areas of mathematics, on the sub-scales of Deduction and Interpretation, there was a significant difference. For Deduction, a mean of 7.23 ( $t = -2.84$ ) and in Interpretation, a mean of 5.00 ( $t = -2.22$ ) was shown. A significant relationship was also shown in the sub-scale Interpretation among CTE area teachers in high school  $t = 3.64$ ,  $p = .08$ ). Those who did not teach CTE had a “t” score of 2.04 and  $p = .04$ ). .

Another variable examined for its relationship with critical thinking abilities was years of teaching experience. For the purposes of this study, the researcher categorized the years of teaching experience. Only one positive correlation was found in the Recognition of Assumptions scale ( $r = .16$ ,  $p = <.00$ ). This was at the high school level.

#### Objective Four

Objective Four was to compare the critical thinking abilities (as measured by the Watson-Glaser Critical Thinking Appraisal Short Form) of public school (certified) teachers in a parish in Southwest Louisiana by the level of their current primary teaching assignment (defined as elementary, middle, or secondary). A one-way ANOVA was run and there was no evidence that homogeneity of variance assumption had been violated in the results.

#### Objective Five

Objective Five was to determine if a model exists explaining a significant portion of the variance in critical thinking abilities (as measured by the Watson-Glaser Critical Thinking

Appraisal Short Form) of public school teachers in a parish in southwest Louisiana from the following personal and professional demographic characteristics:

- a. Gender,
- b. Race,
- c. Age,
- d. Highest level of education completed,
- e. Grade level (s) taught (defined as elementary, middle, or high school),
- f. Subject (s) taught, and
- g. Years of teaching experience.

The findings were that there was no instance of excessive collinearity among independent variables in the data. Two-way correlations between factors used as independent variables in the regression and the dependent variable showed only one variable to be statistically significant among the different variables. That variable was Race. Considered alone, the Race variable explained 4.3% ( $F_{\text{change}} = 13.970$ ,  $p = <.001$ ) of the variance in the critical thinking skills of public school teachers in a parish in Southwest Louisiana.

### **Conclusions, Implications, and Recommendations**

The following conclusions, implications, and recommendations were derived from the findings of the study and are described in this section.

#### **Conclusion One**

The content area of mathematics in high school influences the critical thinking abilities of public school teachers in a parish in Southwest Louisiana. This conclusion is based on the following findings of the study: in the secondary area, high school mathematics teachers had higher raw scores than their counterparts on the *Watson-Glaser Critical Thinking Appraisal Short Form* Test subscales of Deduction ( $M = 7.23$ ,  $SD = 1.36$   $t = -2.84$ ), Interpretation ( $M =$

5.00,  $SD = 1.29$ ,  $t = -2.22$ ), and the Overall Critical Thinking Ability score ( $M = 28.38$ ,  $SD = 5.24$ ,  $t = -2.20$ ). One possible explanation for this is mathematics teachers in high school have backgrounds of hierarchical learning and teaching. Going from a basic fundamental nature of concepts to building upon more inductive reasoning as math courses progress at the secondary level requires that mathematics teachers grasp critical thinking concepts such as Interpretation and Deduction. The researcher theorizes that mathematical terminology and mathematical skills lend themselves to the critical thinking found in the Watson-Glaser sub-scales. The researcher recommends additional research to confirm or disprove the finding that math content influences critical thinking skills in the high school area. The researcher would like to see the studies concentrate on teachers of algebra versus teachers of geometry versus teachers of calculus, thereby checking to see if there are critical thinking ability raw score differences in the higher order thinking of the specialized areas of mathematics. This procedure would identify math courses where the greatest emphasis could be placed on teaching critical thinking skills to high school students.

### Conclusion Two

Whether or not teachers are Caucasian influences critical thinking abilities. This conclusion is based on the finding that four of the five sub-scales showed that Caucasians had higher critical thinking scores than other races. The subscales are Deduction ( $M = 6.02$ ,  $SD = 1.659$ ,  $t = -4.194$ ), Inference (see Table 12 on page 76) ( $M = 3.41$ ,  $SD = 1.516$ ,  $t = -2.111$ ), Recognition of Assumptions ( $M = 5.48$ ,  $SD = 1.976$ ,  $t = -2.664$ ) and Overall Critical Thinking Ability ( $M = 25.66$ ,  $SD = 1.711$ ,  $t = <.001$ ). Possible explanations include cultural bias in the instrument. In this particular study, there is not a great variation in the design of the critical thinking test. Therefore, the respondents were limited to one type of format, multiple-choice. Multiple-choice is criticized by Lisa Tsui in her 2006 critical thinking study (742). The

researcher recommends research using diverse formats for measuring critical thinking and using more than one critical thinking instrument to see if such hypotheses can be confirmed. Multiple diverse studies can bring valuable research knowledge and enlightenment. Another explanation for Caucasians scoring higher in this study is university emphasis in their preparatory teacher education programs. The researcher recommends qualitative studies among other groups of public school teachers in other parishes to identify differences among those teachers who have the highest or lowest scores on critical thinking tests. These descriptive studies should also examine the university, the strategies of instructors at the collegiate level – whether teaching using higher level critical thinking activities or not, teacher education programs, and the initial certification of those who showed higher critical thinking abilities. Such knowledge can be used to strengthen teacher education programs and can also be used to pinpoint needed areas of professional development focusing on strengthening critical thinking abilities. The findings from these recommended studies can aid LEA (Local Education Agency) personnel decisions about hiring teachers.

### Conclusion Three

The content area of social studies in middle school influences the critical thinking abilities of public school teachers in a parish in Southwest Louisiana. This conclusion is based on the following findings of the study: in the middle school area, social studies teachers had higher raw scores than their counterparts on the *Watson-Glaser Critical Thinking Appraisal Short Form* Test subscale of Interpretation ( $M = 4.72$ ,  $SD = 1.13$ ,  $t = -2.45$ ). One possible explanation for this becomes evident when looking at the different parts of the test. The Interpretation part of the WGCTA Short Form is designed for the purpose of “weighing evidence and deciding if generalizations or conclusions based on the given data are warranted” (WGCTA Manual 4). The social studies curriculum in middle school lends itself to discussions, role-

playing, debates, and question-answer sessions. Activities of making generalizations or drawing conclusions are practiced on a daily basis. The researcher finds that further research is needed in this area because the teachers fared better on the Interpretation piece or subscale than on the Evaluation of Arguments subscale. This finding is very puzzling because the latter subscale is “distinguishing between arguments that are strong and relevant and those that are weak or irrelevant to a particular issue” (WGCTA Manual 4). According to the researcher, this subscale should also lend itself to the everyday classroom teaching activities in a middle school social studies class. The researcher, therefore, recommends further studies in the middle school area on social studies teachers and the adopted curriculum to find if there are discrepancies in the curriculum that may be a factor in higher or lower critical thinking abilities on the WGCTA Short Form among middle school social studies teachers.

#### Conclusion Four

The majority of teachers in Calcasieu parish are females. This conclusion is based on the finding that 84.2% of the population in the sample were female ( $n = 272$ ) and that 15.8% were male ( $n = 51$ ). Since there was no difference found in the critical thinking abilities in the gender category, the researcher recommends that a second study be made to determine whether males or females in the omitted schools in the same parish might not show gender critical thinking differences. She further recommends that the results, implications, and recommendations from the new study be reported to the parish superintendent and to the principals of the selected multi-level schools. The administrators can use such information about teachers' critical thinking skills to make personnel decisions on grade and subject assignments in the schools.

#### Conclusion Five

The majority of teachers in a parish in Southwest Louisiana have bachelors' degrees. This conclusion is based on the findings from the study demographic questionnaires. The results

show that of 322 participants, 216 identified themselves as having bachelors' degrees (67.1%). One possible explanation for this is the lack of funding or tuition exemption available to reimburse teachers. Since teachers in this parish begin the pay ladder at the lowest scale, the salaries they receive are not adequate to support the costs involved when returning to take course work at universities. Although testing in this study did not show that critical thinking skills were influenced by teachers with masters', masters' plus thirty certification, and specialist degrees (see Table 14), other studies do show that higher-degreed teachers exhibited higher critical thinking skills than other teachers who only had bachelors' degrees (Onwuegbuzie 2001). The researcher believes further studies using other critical thinking instruments may disprove the finding in this study since the *Watson-Glaser Critical Thinking Appraisal Short Form Test* is limited according to testing format (multiple-choice items only). The researcher would like to see the parish adopt policies that encourage teachers to pursue advanced degrees. The researcher's recommendations include a tuition exemption program for less experienced teachers.

### Conclusion Six

Teachers in this study had low levels of critical thinking ability. This conclusion is based on the findings that the 324 teachers who tested in this parish in Southwest Louisiana had mean scores equal to 25.29 with a standard deviation of 4.557. In the normative group of 119 participants listed in the Manual of *Watson-Glaser Critical Thinking Appraisal Short Form Test*, the raw score mean was 30.2 and the raw score standard deviation was 5.4 (Watson-Glaser 57). However, the researcher points out that, in her study, there were 324 participants and this number should have more generalizability than the Watson-Glaser Norms, where only 17.3% of that group were teachers. Other persons labeled under the term "education" were supervisors, hourly/entry-level employees, managers, directors, and executives (Watson-Glaser Manual 47). The researcher interpreted the 17.3% as being the actual teaching population of the norm group

(Watson-Glaser 47). The others from the Watson-Glaser Norm Group as listed were hourly or entry-level workers, supervisors, managers, directors, and executives (Watson-Glaser 57). The seventeen and three-tenths percent would be 21(20.587). The number of participants in the *Watson-Glaser Critical Thinking Short Form Test* norm group (n = 119) is very small in comparison to the study's norm group (n = 324). The label in the Watson-Glaser Manual for the norm group "Education" was "Various occupation within the education industry" (Watson-Glaser 57). The researcher suggests that future norm groups with a substantial addition of public school teachers be added to the norms compiled by testing company who publish critical thinking tests or appraisals. The researcher also suggests that the publishers of critical thinking tests supply testing materials or other incentives for doctoral candidates and university dissertation committees in order to gain valuable data for establishing new norms.



## REFERENCES

- Ary, Donald, Lucy C. Jacobs, and Asghar Razavieh. Introduction to Research in Education. 6<sup>th</sup> ed. Belmont: Wadsworth, 2002.
- Bacon, C. S., and C. J. Thayer-Bacon. "Real Talk, Enhancing Critical Thinking Through Conversation in the Classroom." The Clearing House 66 (n.d.): 181-184.
- Bennett, Dorothy, and Jan Hawkins. Alternative Assessment (1997): ERIC, n.p.
- BESE Members. Board of Elementary and Secondary Meetings, State of Louisiana. Personal interviews. 2007.
- Bloom, Benjamin. Taxonomy of Educational Objectives. New York: Longman, 1956.
- Brookfield, Stephen D. The Power of Critical Theory. San Francisco: Josey-Bass, 2005.
- Cabrera, George A. "Reading Critically about Critical Thinking: Recommended Sources." Journal of Reading 37 (1994): 423-435.
- Chaffee, John. The Thinker's Guide to College Success. 2<sup>nd</sup> ed. Boston: Houghton, 1999.
- Cherubini, Lorenzo. "Exploring prospective teachers' critical thinking: Case-based pedagogy and the standards of professional practice." Teaching and Teacher Education 25 (2009): 228-234.
- Christen, William L., and Thomas Murphy. "Increasing Comprehension by Activating Prior Knowledge." ERIC Digest Bloomington: ERIC Clearinghouse (1991): ERIC # ED328885.
- Cohen, Mel. "Making Critical Thinking a Classroom Reality," Miami University Middletown, (retrieved 3/1/2006). [www.jstor.org.libezp.lib.lsu.edu](http://www.jstor.org.libezp.lib.lsu.edu)
- Commeyras, Michelle. "Tracing the Evolution of Research: From Critical Thinking to Literacy Partnerships." ERIC Digest (May 1995): ERIC # ED382921.
- "Critical Thinking on the Web." (1 Jan 2003)  
<<http://www.philosophy.unimelb.edu.au/reason/critical>>.
- "Critical Thinking Skills and Teacher Education." Office of Educational Research and Improvement, US Dept of Education.  
ERIC Digest 3-88
- Darling-Hammond, Linda. "Recruiting Teachers for the 21<sup>st</sup> Century: The Foundation for Educational Equity." 1 June 2006 <<http://80-www.jstor.org.lib>>.

- Deggs, David. Personal interview. October and November, 2003.
- Dewey, John. The Collected Works of John Dewey, Middle Works 1899-1924, 1916.
- Dilenschneider, Robert L., “Executive Speeches.” Atlanta: Public Relation Society of America, 2000.
- Dutton, Wendy, Thomas Hart, and Rebecca Patten. “Critical Thinking and the Christian Perspective: A Response to Baird and Sodon.”
- Dyrud, Marilyn A., and Rebecca Worley. “Critical Thinking: Thinking Skills in Education.” Business Communication Quarterly 61 (1998): 62-64.
- Edmundson, L. “Critical Thinking: It Begins at Home.” Academic Exchange Quarterly 4 (2000): 136.
- Ennis, Robert H. “Critical Thinking Assessment,” Theory Into Practice 32 (Summer 1993): 179-218.
- Facione, Peter. “Critical Thinking: What it is and Why it Counts.” California Academic Press. 1998.
- Feldman, Daniel A. Critical Thinking: Strategies for Decision Making. Boston: Course Technology, 2002.
- Fisher, Alec. Critical Thinking: An Introduction. New York: Cambridge UP, 2001.
- Fredericks, Anthony D. Redefining the Three Rs: Relax, Refocus, Recharge. Rigby Best Teachers P, 2003.
- Frye, Barbara, Nancy Alfred, and Margaret Campbell. “Use of the Watson-Glaser Critical Thinking Appraisal Nursing with BSN Students.” Health Care Perspectives 20.5 (1999): 253.
- Gary, Kevin. “Leisure, Freedom, and Liberal Education.” Educational Theory (April 2006):121-136.
- Geertsen, R. “Rethinking Thinking about Higher-level Thinking Teaching Sociology # 1” American Sociological Association, (January 2003): 1-19.
- Giancarlo, Carol et.al. “Assessing Secondary Students’ Disposition Toward Critical Thinking: Development of the California Measure of Mental Motivation” Education and Psychological Measurement, 64.2 (April 1, 2004): 347-364.
- Gibaldi, Joseph. MLA Handbook for Writers of Research Papers. 6<sup>th</sup> ed. New York: MLA, 2003.

- Gravetter, Frederick J., and Larry B. Wallnau. Statistics for the Behavioral Sciences.. 5<sup>th</sup> ed. Belmont: Wadsworth, 2000.
- Grosser, M. M. and B. J. J. Lombard. "The relationship between culture and the development of critical thinking abilities of prospective teachers." Teaching and Teacher Education 24.5. (July 2008): 1364-1375
- Hair, Joseph, Jr. et al. Multivariate Data Analysis. 6<sup>th</sup> ed. Upper Saddle River, New Jersey Pearson Education Inc., 07458: 2006.
- Heath, Phillip. Science/ Technology/ Society in the Social Studies. 1988.
- Higgins, Chad. Personal Interview. October, November 2003.
- Hinkle, Dennis E., William Wiersma, and Stephen G. Jurs. Applied Statistics for the Behavioral Sciences. 4<sup>th</sup> ed. Boston: Houghton, 1998.
- Hoefler, James M. "Critical Thinking and the Use of Optical Illusions." 27 (Sep1994) 538-545 1 Mar 2006. <<http://www.jstor.com>>.
- Holmgren, B. and T. Covin. "Selective Characteristics of Pre-service Professionals." Education 104 (2006): 3, 321-328.
- Jenkins, Elizabeth K. "The Significant Role of Critical Thinking in Predicting." Journal of Education for Business 73 (May/ June 1998): 274-280.
- Jennings, Marianne M., "What's Behind the Growing Generation Gap?" USA Today: (Nov 1999).
- Jensen, Eric. Teaching with the Brain in Mind. 2<sup>nd</sup> ed. Alexandria: ASCD, 2005.
- LaCapra, Dominick. "The University in Ruins?" Critical Inquiry (Aug 1998): 32-50.
- Leming, James S. "Some Critical Thoughts about the Teaching of Critical Thinking." The Social Studies 89 (Mar-Apr 1998): 61-66,. Electronic collection:A20632458.
- Louisiana State Department of Education Policies Handbook (July 1,2006 effective date): 58-67.
- "Louisiana Components of Effective Teaching, Appendix E." Louisiana State Department of Education Policies Handbook (July 1,2006 effective date): n.pag.
- McKendree, Jean, Carol Small, Keith Stennings, and Tom Conlon. "The Role of Representation in Teaching and Learning Critical Thinking," Educational Review 54 (2002): n.pag.

- Merriam, Sharan B., and Phyllis M. Cunningham, eds. Handbook of Adult and Continuing Education. San Francisco: Josey-Bass, 1989.
- Nelson, K. "Seven Ways of Being Smart." Instructor. vol.105 n.d.: 26-32.
- Norris, Stephen P. "Can We Test Validly for Critical Thinking?" Educational Researcher 18 (December 2002): 21-26.
- Notar, Charles E., Janell D. Wilson, and Karol G. Ross. "Distant Learning for the Development of Higher-Level Cognitive Skills." Education 122.4 (2002): 642-648.
- O'Brien, Joseph. "Statewide Social Studies Performance Assessment: Threat or Treat?" The Social Studies vol.88 (Mar-Apr 1997): 53-59.  
Electronic collection: A19997501
- Onwuegbuzie, Anthony J. "Critical Thinking Skills: A Comparison of Doctoral and Masters Students." College Student Journal vol.35.3 (Sep 2001): 477-482.
- Osana, Helena P. , and Jennifer R. Seymour. "Critical Thinking in Preservice Teachers: A Rubric for Evaluating Argumentation and Statistical Reasoning." Educational Research and Evaluation 10.4-6 (n.d.): 473-498.
- Ozmon, Howard A., and Samuel M. Craver. Philosophical Foundations of Education. 7<sup>th</sup> ed. Columbus: Merrill Prentice Hall, 2003.
- Paul, Richard, and Linda Elder. "Critical Thinking and the Art of Close Reading III," Journal of Developmental Education 28 (Fall 2004): 36-37.
- Paul, Richard, and Linda Elder. "Critical Thinking and the Art of Close Reading IV," Journal of Developmental Education 28 (Winter 2004): 36-37.
- Paul, Richard, and Linda Elder. "Critical Thinking: Tools for Taking Charge of Your Learning and Your Life."
- Paul, Richard, Linda Elder, and Ted Bartell. "Study of 38 Public Universities and 28 Private Universities to Determine Faculty Emphasis on Critical Thinking in Instruction; done by Commission on Teaching Credentialing." State of California: 1995: 268-281. <http://www.criticalthinking.org/schoolstudy.htm>>.
- Paul, Richard, A. Fisher, and G. Nosich. "Workshop on Critical Thinking Strategies." Foundation for Critical Thinking Strategies Sonoma State University (1993): n.p.
- Petress, Ken. "Critical Thinking: An Extended Definition." Education 124 (n.d.): 461-66.
- Pithers, RT. and Rebecca Soden. "Critical thinking in Education: A Review." Educational Research 42.3 (Winter 2000) 237-249.

- Reid, C., and B. Romanoff. Using Multiple Intelligences Theory to Identify Gifted Children. Educational Leadership, 2003.
- Riordan, Michael, and E. Kent St. Pierre. The Development of Critical Thinking: Management Accounting 1992.
- Royalty, J. "The Generalizability of Critical Thinking: Paranormal Beliefs Versus Statistical Reasoning." Journal of Genetic Psychology 156.4 (Dec 1995): 477- 489.
- "S-22 Listening Critically: The Art of Silent Dialogue."  
<<http://www.criticalthinking.org/k12/k12class/strat/22html>>.
- Savage, L. B. "Eliciting Critical Thinking Skills Through Questioning." The Clearing House 71 (May-Jun 1998): 291-294.
- Shermis, Samuel. "Reflective Thought, Critical Thinking." ERIC Digest D143 Bloomington: ERIC Clearinghouse (1999) ERIC # ED436007.
- Springer, Marilee. Learning and Memory: The Brain in Action. Alexandria: ASCD, 1999.
- Stears, Michele. "How social and social constructivism can inform science curriculum design: a study from South Africa." Educational Research 51.4 (December 2009): 397-410.
- Torff, Bruce and Edward Warburton. "Assessment of Teacher's Beliefs about Classroom Use of Critical-Thinking Activities." Educational and Psychological Measurement 65 (February 2005):155-179
- Tsui, Lisa. "Fostering Critical Thinking Through Effective Pedagogy: Evidence from Four Institutional Case Studies." The Journal of Higher Education 73 (Nov-Dec 2002): 740-763.
- "22<sup>nd</sup> International Conference on Critical Thinking and Educational Reform."  
<<http://www.criticalthinking.org>>.
- Van Gelder, T., "Teaching Critical Thinking." College Teaching Hong Kong University 53 (n.d.): 1.
- Walters, Kerry. "Critical Thinking, Rationalization, and the Vulcanization of Students." Journal of Higher Education.61 (Jul-Aug 1990): 448-467.  
<<http://www.jstor.com>>.
- Walton, Craig. "Literacy and Critical Thinking: the NAEP Literacy Studies and What We are Not Teaching about Higher Reasoning Skills." United States Department of Education (1989): n.pag.

- Watson, Goodwin and Edward Glaser. Watson-Glaser Critical Thinking Appraisal Test Short Form Manual. Harcourt Assessment, Inc. (Pearson) 2005.
- Wenglinsky, Harold. "Facts or Critical Thinking Skills? What NAEP Results Say." Educational Leadership ASCD (Sep 2004): 32-35.
- Willingham, Daniel T. "Critical Thinking Why If It So Hard To Teach?" American Educator 32 (Summer 2007): 8-19.
- Wilton, Craig. "Literacy and Critical Thinking: The NAEP Literacy Studies and What We Are Not Teaching About Higher Reasoning Skills." United States Department of Education 1989.
- Winn, Ira J. "The High Cost of Uncritical Teaching." Phi Delta Kappan (March 2004): 496-7.
- Wright, Sara. "Never Stop Learning: Graduate Programs in Career and Technical Teaching to Great Lengths to Show Their Worth to Teachers." Techniques 77 (2002): 32-34. Electronic collection: A8687479
- Yeh, S. "Tests Worth Teaching to: Constructing State-mandated Tests That Emphasize Critical Thinking." Educational Researcher 30: (n.d.).

## **APPENDIX A: INSTITUTIONAL REVIEW BOARD APPROVAL FOR STUDY**





APPENDIX B: CERTIFICATE OF COMPLETION FOR TESTING

---

The \_\_\_\_\_ Parish School System  
Division of Accountability and Assessment, Research &  
Special Services  
presents this

Certificate of Completion  
to

---

for participating in the  
***Critical Thinking Skills Appraisal one hour work-related in-service***  
**1 Continuing Learning Unit \***

*Presented this \_\_\_\_\_ day of May, two thousand and nine*

Dale B. Schanz

Reading Specialist  
Instructional Coach  
\_\_\_\_\_ Parish School System  
Assessment & Accountability

APPENDIX C: WATSON-GLASER CRITICAL THINKING APPRAISAL SHORT  
FORM COPY OF COVER



# Short Form Test Booklet

## Directions

This booklet contains five types of tests designed to find out how well you are able to reason analytically and logically.

Each test has separate directions that should be read carefully.

Do not turn this page until you are instructed to do so.

Do not make any marks in this test booklet.

All answers are to be marked on the separate answer sheet provided. Use a sharp No. 2 pencil to mark your answers. If you wish to change an answer, be sure to erase your old answer completely.

Goodwin Watson & Edward M. Glaser



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ISBN 015433940-7



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## **APPENDIX D: WATSON-GLASER CRITICAL THINKING ASSESSMENT PERMISSION LETTER**

Date: August 3, 2009

Requestor(s): Dale Schanz

Located at: 2899 Con Dios Lane

Sulphur, LA 70663

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## **APPENDIX E: DEMOGRAPHIC QUESTIONNAIRE**

ID Number \_\_\_\_\_, B. School Number \_\_\_\_\_, C. School Level \_\_\_\_\_

**Demographic Information Questionnaire** (Please put only one answer per numbered item.)

1. Identification Number \_\_\_\_\_ (same as the answer document)
2. What is your gender? \_\_\_\_\_ (a) Male \_\_\_\_\_ (b) Female
3. What is your race?  
\_\_\_\_\_ (a) African-American  
\_\_\_\_\_ (b) White  
\_\_\_\_\_ (c) Asian  
\_\_\_\_\_ (d) Hispanic  
\_\_\_\_\_ (e) Other (Please specify.) \_\_\_\_\_
4. What is the highest level of education you have achieved?  
\_\_\_\_\_ (a) High school graduate/ GED  
\_\_\_\_\_ (b) Some college, university, vocational school  
\_\_\_\_\_ (c) Bachelor's Degree (B.S., B.A., etc.)  
\_\_\_\_\_ (d) Master's Degree  
\_\_\_\_\_ (e) Master's Degree Plus 30  
\_\_\_\_\_ (f) Educational Specialist  
\_\_\_\_\_ (g) Doctorate (Ed.D. or Ph.D.)  
\_\_\_\_\_ (h) Other (Please specify.) \_\_\_\_\_
5. How many years of teaching experience (including this year) do you have? \_\_\_\_\_
6. What is your age, in years, as of your last birthday? \_\_\_\_\_
7. Are you certified in your primary teaching area? \_\_\_\_\_ (a) Yes \_\_\_\_\_ (b) No
8. What is the level at which you teach?  
\_\_\_\_\_ (a) Elementary grades k-5 (Skip to Item # 9.)  
\_\_\_\_\_ (b) Middle, grades 6-8 (Skip to Item # 10.)  
\_\_\_\_\_ (c) High School, grades 9-12 (Skip to Item # 11.)
9. What is the principal content area you teach in elementary school? (Please check only one.)  
\_\_\_\_\_ (a) Reading  
\_\_\_\_\_ (b) Mathematics  
\_\_\_\_\_ (c) Social Studies  
\_\_\_\_\_ (d) Science  
\_\_\_\_\_ (e) Other (please specify.) \_\_\_\_\_
10. What is the principal content area you teach in middle school? (Please check only one.)  
\_\_\_\_\_ (a) Language Arts (Reading, English)  
\_\_\_\_\_ (b) Mathematics  
\_\_\_\_\_ (c) Social Studies  
\_\_\_\_\_ (d) Science  
\_\_\_\_\_ (e) Foreign languages (French, Spanish)  
\_\_\_\_\_ (f) Other (please specify.) \_\_\_\_\_
11. What is the principal content area you teach in high school? (Please check only one.)  
\_\_\_\_\_ (a) Language Arts (English, Reading)  
\_\_\_\_\_ (b) Mathematics (Algebra, Plane Geometry, Calculus, etc.)  
\_\_\_\_\_ (c) Social Studies (American History, Government, Civics, etc.)  
\_\_\_\_\_ (d) Science (Physical Science, Chemistry, etc.)  
\_\_\_\_\_ (e) Arts (Art, Band, Choral Music, Orchestra, Drama, etc.)  
\_\_\_\_\_ (f) Foreign Languages (French, Spanish, Russian, Latin, etc.)  
\_\_\_\_\_ (g) Career and Technical Education (Please specify course with a \_\_.)  
\_\_\_\_\_ Agriscience \_\_\_\_\_ Business \_\_\_\_\_ Family and Consumer Science  
\_\_\_\_\_ Technology Education \_\_\_\_\_ Other (Please specify: \_\_\_\_\_.)



## **APPENDIX F: LETTER TO PRINCIPALS**

1618 Mill Street  
Lake Charles, Louisiana 70601  
May 10, 2009

Dear Principal,

Have you ever wondered whether your teachers exhibit skills of critical thinking? Because in recent years we have often heard the term, “critical thinking skills” or “higher-order thinking,” one cannot help but wonder which persons have real critical thinking skills. I am presenting an opportunity for you to determine information about your faculty and a prospect for you to plan some possible future sessions of professional development in the higher-order thinking area.

\_\_\_\_\_ of LSU and I have drawn your school in a stratified random sample. “Factors that Influence the Critical Thinking Abilities of Public School Teachers in a Parish in Southwest Louisiana” is the name of the study I am currently working on through the university. In order to get the necessary quantitative and qualitative data for this topic, I must administer critical thinking surveys on the teachers. Such a study will be useful for you when the scores for this appraisal are reported. The results will be reported in terms of **group normative data**, not about individuals. NCLB and LATAAP both promote and encourage the teacher’s use of critical thinking activities and questioning techniques in the classroom. Therefore, the scores I collect and analyze will give you a chance to look at your teachers’ normed data and draw conclusions about your faculty. Again, there will be no identification of individuals. You and your faculty may be assured of complete confidentiality. The questionnaire has a **school** identification number, which will also be printed on the *Watson-Glaser* answer document.

Your school is very important to this survey! The results of this research will be made available through LSU and the Calcasieu Parish School System’s superintendent’s office. Superintendent \_\_\_\_\_ has given his approval to this study.

Time is very short before our session ends. I am hopeful that you will quickly sign up and email me so that your faculty can be appraised as soon as possible. I will be using two instruments in this process: the *Watson-Glaser Critical Thinking Short Form* and a designed demographic questionnaire. The *Watson-Glaser* takes about 30 minutes to administer and the demographic questionnaire takes about two minutes. After your faculty members hand in the questionnaire and the appraisal, they will be given a certificate showing an earned CEU on the graphic part of the paper.

If you have any questions or want to personally schedule your school by phone, please call me at my office, \_\_\_\_\_, extension \_\_\_\_\_, or \_\_\_\_\_, my \_PSB cell number. My home phone is also available to you: \_\_\_\_\_. Thank you so much for your assistance.

Sincerely,

**Dale B. Schanz**

School	Drawn as 1 <sup>st</sup> , 2 <sup>nd</sup> , etc.	Requested Date for Faculty Appraisals	Completed on this Date
<b><i>High School</i></b>			
	1 <sup>st</sup>		
	2nd		
	3rd		
Exp: Ima Word High School	4th		
<b><i>Middle Schools</i></b>			
	1 <sup>st</sup>		
	2nd		
	3rd		
	4th		
	5th		
<b><i>Elementary Schools</i></b>			
	1st		
	2nd		
	3rd		
	4th		
	5th		
	6th		

The following dates are open for me to administer the \_\_\_\_\_ *Critical Thinking* \_\_\_\_\_: **May 15, May 21 during the day, May 22, May 25, May 26, during the day, May 27 in the morning only, May 29, from 9:30 A.M. until early afternoon.**

**I am available to administer the appraisals during the day or immediately after school, during your faculty meeting time.** . Please let me know **by response to emails** or on the phone: \_\_\_\_\_, **ext.** (office), \_\_\_\_\_ (home), \_\_\_\_\_ (\_PSB cell) or by email to \_\_\_\_\_ . Thank you so much.

Dale B. Schanz

## VITA

Dale Beglis Schanz, a native of Sulphur, Louisiana, graduated from Sulphur High School in 1964. Dale received an H.L.Doherty scholarship to attend McNeese State University. In 1970, she graduated from McNeese with a bachelor of arts degree in elementary education, grades 1-8. She has taught and worked in the Calcasieu Parish School System since 1970 with the exception of the years 1971-73 and 1974-76. Most of her years of teaching were at LeBlanc Middle School where she taught reading, English, Spanish, social studies, and teen leadership. In addition to teaching content areas, she was an active sponsor in LeBlanc Cheerleaders, LeBlanc Dance Team, *The Mask & Shield* newspaper, the school marquee, the Builders Social Studies Club, Fellowship of Christian Athletes, Campus Ambassadors for Christ, the Veterans Day Program, the Social Studies Mayoral Forum, the Cal-Cam Queen Contest, various fundraisers, the LeBlanc Social Studies Fair, and the Sadie Hawkins' Dance.

For the past five and a half years, she has been serving the Calcasieu Parish School System as an instructional coach and a reading specialist. During recent years, her civic duties included serving on the Democratic State Central Committee and presiding over various organizations and entities such as Gamma Beta of the Delta Kappa Gamma Teachers' Honor Society, Louisiana Council for the Social Studies Conference and State Organization, MITE Christian Women's Investment Club, and the Cornerstone Christian Fellowship Task Force Organizational Committee. She is a member of the Calcasieu Parish Library Board of Control and the Calcasieu Federation of Teachers. In addition, she has coached two recreation teams, a church league women's softball team and a t-ball girls' softball team. Dale continues to serve as the director of the Region V Social Studies Fair for the parishes of Allen, Beauregard, Calcasieu, Cameron, and Jeff Davis.

Dale Beglis Schanz received a Master of Education degree in 1983 from McNeese entitled, “Reading Specialist.” In 1991, she received a Master’s Plus 30 giving her certification in secondary English, grades 6-12. In 1997 she became a certified supervisor of student teachers. Recently, in the year 2008, Dale B. Schanz completed both a Jim Knight Institute at Kansas University giving her certification to teach others “How to Facilitate and Coach” plus five weeks of extensive training to become an area trainer of *LANGUAGE!*, a replacement curriculum for struggling readers.

Dale Schanz has been married to David John “Jack” Schanz, Jr. for 40 years. They are the parents of two daughters, Dielle Schanz Barrentine (Robert “Binky”) and Dara Jo Schanz Johnson (Timothy Happy). Dale and Jack Schanz have three granddaughters: Jacquelyn Wade, Alexa Barrentine, and Emma Barrentine. All of the girls are working in school in some capacity as well as Robert “Binky.” Dielle is the assistant principal at Sulphur High School Ninth Grade Campus. Dara is a sixth grade science teacher at S. P. Arnett School in Westlake, Louisiana. Jacquelyn is a Spanish immersion student at W. W. Lewis Middle School in Sulphur, Louisiana. Alexa is a kindergartener at Frasch Elementary School in Sulphur and Emma is a toddler at Henning Methodist Church Pre-school. Robert “Binky” Barrentine is an assistant principal at W.W.Lewis Middle School in Sulphur, Louisiana. The whole family enjoys outdoor activities, including volleyball, softball, basketball, gardening, and horse back riding. Reading is a favorite pastime for the “D’s:” David Jack, Dale, Dielle, and Dara.

Dale Beglis Schanz will receive her Doctor of Philosophy degree at the May 2010 commencement.